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MECCANO MAGAZINE

WORM REDUCER ON TEST (page 93)

6D.

Next Month: "BESSEMER AND THE STEEL CONVERTER." Ready: 1st April

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With the Editor

Good Things to Come

Next month I start a new series of lives of famous inventors with Sir Henry Bessemer, best known in connection with his famous converter. The cover, showing a converter in action, will be a particularly striking one. Next month also there will be a long article describing the remarkable results obtained from household rubbish by the latest salvage methods.

In the May issue will appear the first of three articles on Thomas Alva Edison, who was in many ways the most remarkable of all inventors. To a great extent inventors have been solitary workers, but this truly remarkable man employed a large staff of experts to assist him in his researches. In this issue also I hope to include a particularly interesting story by "Railway Engineer" of a footplate run on an L.N.E.R. goods train, and a description of Washington, U.S.A., in wartime.

The June number will contain an account of the Curtiss P-40E fighter, with a cover picture of this machine in flight.

These are just a few of the good things to come.

Leaders in the War

XXVII.—Sir William Sholto Douglas

Air Marshal Sir William Sholto Douglas was born in 1893 and educated at Tonbridge and Oxford. He joined the Royal Field Artillery in 1914, went to France, and was seconded to the Royal Flying Corps early in 1915. He became an observer in No. 2 squadron, and in those days took air photographs of enemy positions with a hand camera pointed through a hole in the fuselage floor. Subsequently he qualified as a pilot, and won both the M.C. and the D.F.C. Under his leadership No. 84 squadron destroyed 201 German machines between September 1917 and the Armistice.

Air Marshal Sir William Sholto Douglas, K.C.B., M.C., D.F.C., Air Officer Commanding-in-Chief, Fighter Command, R.A.F.

Between the end of the 1914-18 war and the outbreak of the present one he served in the Sudan, and held important appointments at home. He was Assistant Chief of the Air Staff in 1938-40, and Deputy Chief of that Staff from April to November 1940, when he was made Air Officer Commanding-in-Chief, Fighter Command, R.A.F. He was knighted last year.

Air Marshal Douglas is a born fighter, resourceful, and independent in outlook.

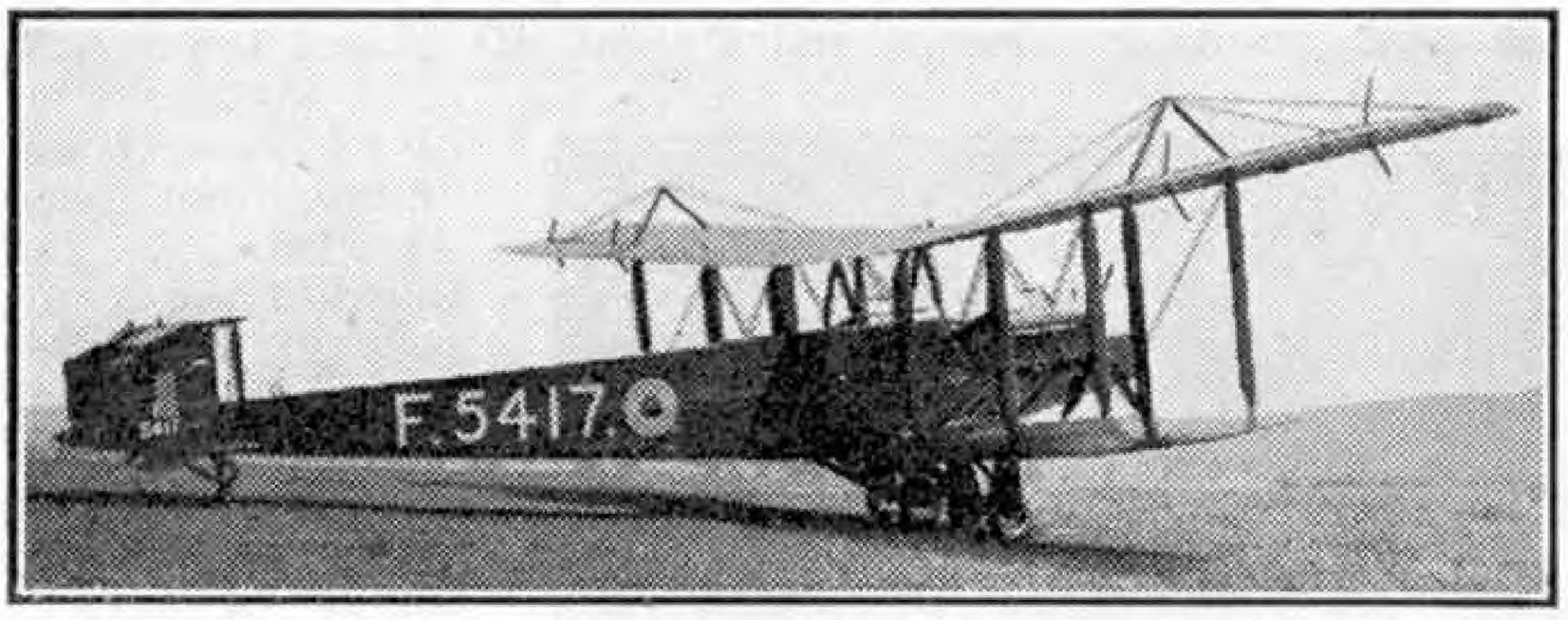
The Navy that Flies

By C. G. Grey

Founder of "The Aeroplane" 1911, Editor until September, 1939

"UNDER God the British Navy is the sure shield of these islands." That was said a long time ago and I cannot trace who said it, but it is as true to-day as when it was said, and it was equally true when Carausius, who was Admiral of the Imperial Roman Channel Fleet in A.D.289, cut loose from Roman authority and established himself as "Augustus" in Britain and held himself independent of Rome for ten years by virtue of his fleet.

Mr. Gibbon in his "*Decline and Fall of the Roman Empire*"—one of the world's most humorous books—says of Carausius: "His fleets rode triumphant in the Channel, commanded the mouths of the Seine and the Rhine, ravaged the coasts of the ocean, and diffused beyond the 'Columns of Hercules' (Gibraltar) the terror of his name. Under his command Britain, destined in a future age to obtain the empire of the sea, already assumed its natural and respectable station of a maritime power.



Handley Page 0/400 type machine, our first twin-engined Bomber. Photograph by courtesy of Handley Page Ltd.

That was the real beginning of Britain's sea-power. To-day sea-power depends on its alliance with air-power. The sinking of H.M.S. "*Prince of Wales*" and H.M.S. "*Repulse*," and the sinking of American warships in Pearl Harbour by the Japanese, show how vulnerable ships are against aircraft. But on the other hand the German and Italian campaign in Libya equally shows that aircraft alone cannot command the sea. Without the Navy's submarines, cruisers, destroyers and big ships, the Germans would have been able to reinforce their troops in Africa to almost any extent.

To-day the Royal Navy has its own Naval Air Service—commonly known as the Fleet Air Arm—and everybody in the Navy, except perhaps a few admirals whose ideas are very antique, realises that without its Air Service the Navy would be as useless as a battleship without big guns or a submarine without torpedoes. But the Navy did not always think so. So let us take a look back through the history of this Naval air business.

In 1909 the Committee of Imperial Defence, seeing that Count Zeppelin and Major von Parseval had achieved considerable success with rigid and non-rigid airships, and that the Wright Brothers and Glenn Curtiss had flown in the United States and that McCurdy and Casey Baldwin had flown in Canada and that several people were flying in France, decided that something ought to be done about it by the King's Fighting Services. So they decided that the Navy should take on the building and operation of airships and that the Army should look after aeroplanes, that is to say, lighter-than-air and heavier-than-air craft respectively.

There is no room here to go into the details of how the Navy's first airship, nicknamed the "Mayfly" because it did not, broke its back coming out of its shed at Barrow-in-Furness, or of the very funny things that happened with the Army's early aeroplanes. We must almost ignore the airships although one could easily write a book about them—what they did in the last war and what they might have done in the present one.

Naval aviation, that is to say aeroplane flying, really began in 1911 when their Lordships of the Admiralty graciously allowed four officers to draw full pay while they were being taught to fly at the Aero Club's (not yet "Royal") aerodrome at Eastchurch by a member of the Club, Mr. George Cockburn, free of charge, on aeroplanes built by Short Bros. at Eastchurch, and paid for by Mr. Frank McClean, another member of the Club.

The Aero Club had put up this sporting offer at the request of Mr. McClean (now Sir Francis), and the Admiralty asked for volunteers and four officers were selected. They were Commander Samson, Lieut. Longmore and Lieut. Gregory, all R.N., and Lieut. Gerrard, Royal Marine Light Infantry. They all turned out to be excellent pilots. And by the middle of 1912 the Admiralty had sent a lot of other officers and men to Eastchurch to learn to fly.

In 1912 the Admiralty and the War Office agreed to start a joint Central Flying School on Salisbury Plain, and the Cabinet decided to form a Royal Flying Corps which should have a Naval Wing and a Military Wing. Pilots and mechanics were to be trained together at the C.F.S., and afterwards the Naval Wing would work with the Navy and the Military Wing with the Army. That only lasted for a few months because the Army flying people adopted a policy of standardising everything, just as if they were standardising rifles or field-guns in the Army; whereas the Naval Wing, under the Air Department at the Admiralty, the chief of which was Captain Murray Sueter, R.N. (now Admiral Sir Murray Sueter, M.P.) started to encourage all sorts of young aircraft firms to produce different types of machines so as to be sure of getting the best. Also the Navy started training its own pilots at Eastchurch and ignoring the Central Flying School.

On 1st July 1914 the Royal Naval Air Service came into being officially. Already Commander Samson and other officers had flown off the decks of warships.

The result was that when war broke out in August 1914 the Army had four squadrons of very good pilots on very good standardised machines, and the R.N.A.S had a lot of pilots on a regular menagerie of different types of aeroplanes, most of which had a better performance than the Army's machines. By that time the Navy had already experimented with firing what we should now call a cannon-gun from the nose of one of its aeroplanes, and had experimented with torpedo-dropping with another type.

But unfortunately the sea-going Navy did not understand about and did not care about aeroplanes. There had been practically no bomb-dropping and they

regarded the torpedo-dropping experiments as childish.

The result was that the Navy proper just refused to co-operate with its own Air Arm, despite the fact that it had ceased to be merely the Naval Wing of the Royal Flying Corps and had become the Royal Naval Air Service, by Royal Warrant, a month before the outbreak of war.

As the Navy did not want its aircraft the R.N.A.S. started up a war of its own. A detachment of it with land machines went to Belgium practically on the outbreak of war, and one of its pilots, Flt. Lt. Marix, now Air Commodore, bombed the Zeppelin shed at Düsseldorf and set it alight with an airship inside it. Another, Squadron Commander Spenser Grey, bombed the railway station at Cologne, and although he did little harm he showed what might be expected.

Soon after another R.N.A.S. pilot, Flt. Lt. Bigsworth, bombed an airship in the air and damaged it so much that it crashed in landing. Yet another of them, Flt. Lt. Warneford, shot a Zeppelin down in flames over Belgium, and got the first V.C. in the R.N.A.S.

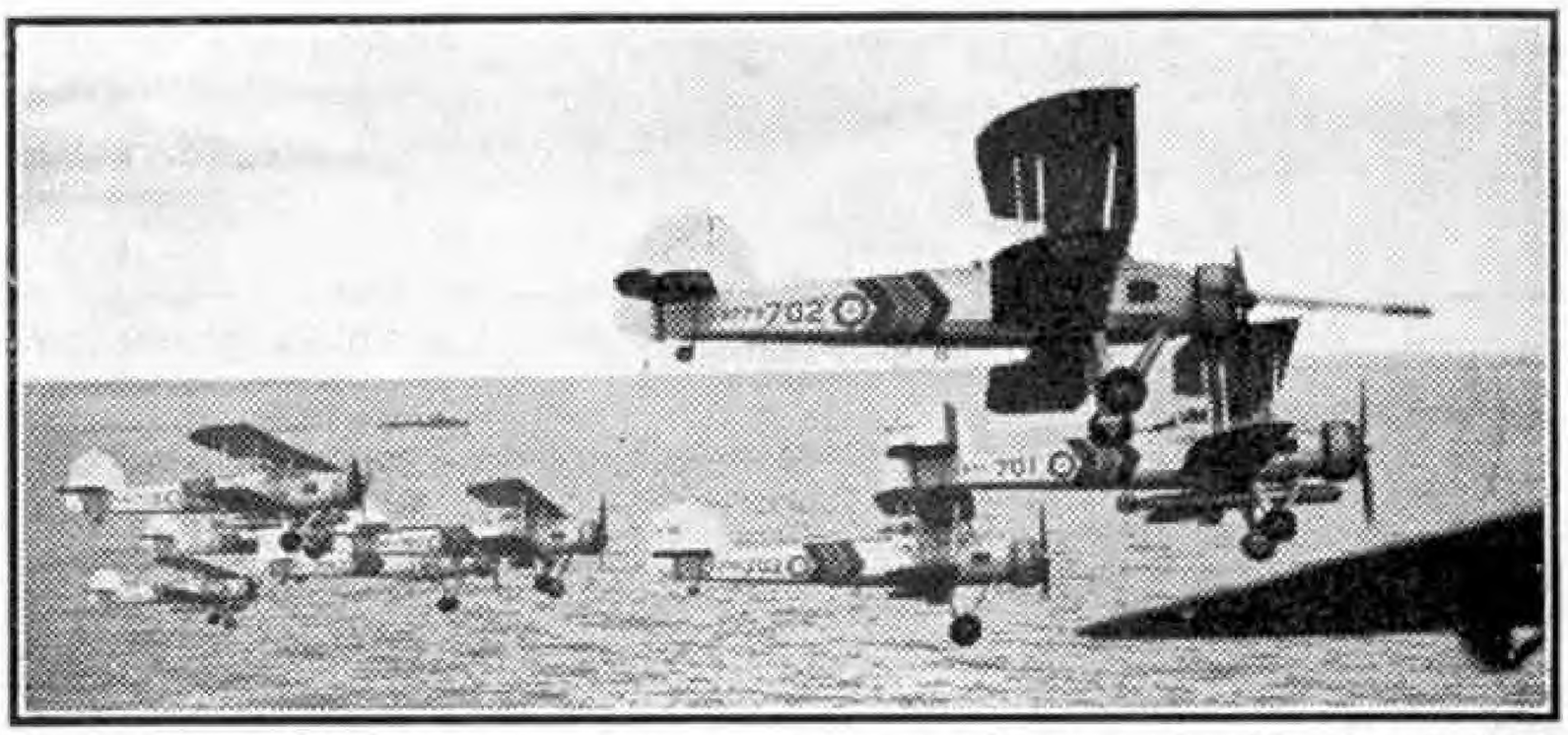
In November 1914 a detachment of three Avros went out to the east of France and from there bombed the Zeppelin sheds at Friedrichshaven on Lake Constance. And on Christmas Day 1914 another detachment, in seaplanes, went up the North Sea in three cross-Channel steamers which had been converted into seaplane-carriers, were let down into the water by derricks, flew off and bombed the German naval ports of Wilhelmshaven and Cuxhaven, and some German battleships, without doing them any particular harm, and came away again.

None of these raids did great damage, but they showed the Germans what was coming, and they had to keep a lot of troops at home and spend a lot of money on anti-aircraft guns to get ready for further attacks from the air.

Possibly the R.N.A.S. might have been wiser if they had kept all that until they had really big aeroplanes with really big bombs—then they might have achieved much greater results plus the advantage of surprise.

Another good thing that Captain Sueter did for the R.N.A.S. was to order twin-engined bombers. The first was that built by Mr. Handley Page, and it was the beginning of the great bombing fleets that we have to-day. The R.N.A.S. also developed float seaplanes, first built by Short Brothers. These were used in hunting for submarines along the coasts of the British Isles, and in the Mediterranean, and round the coasts of Greece and at the Dardanelles.

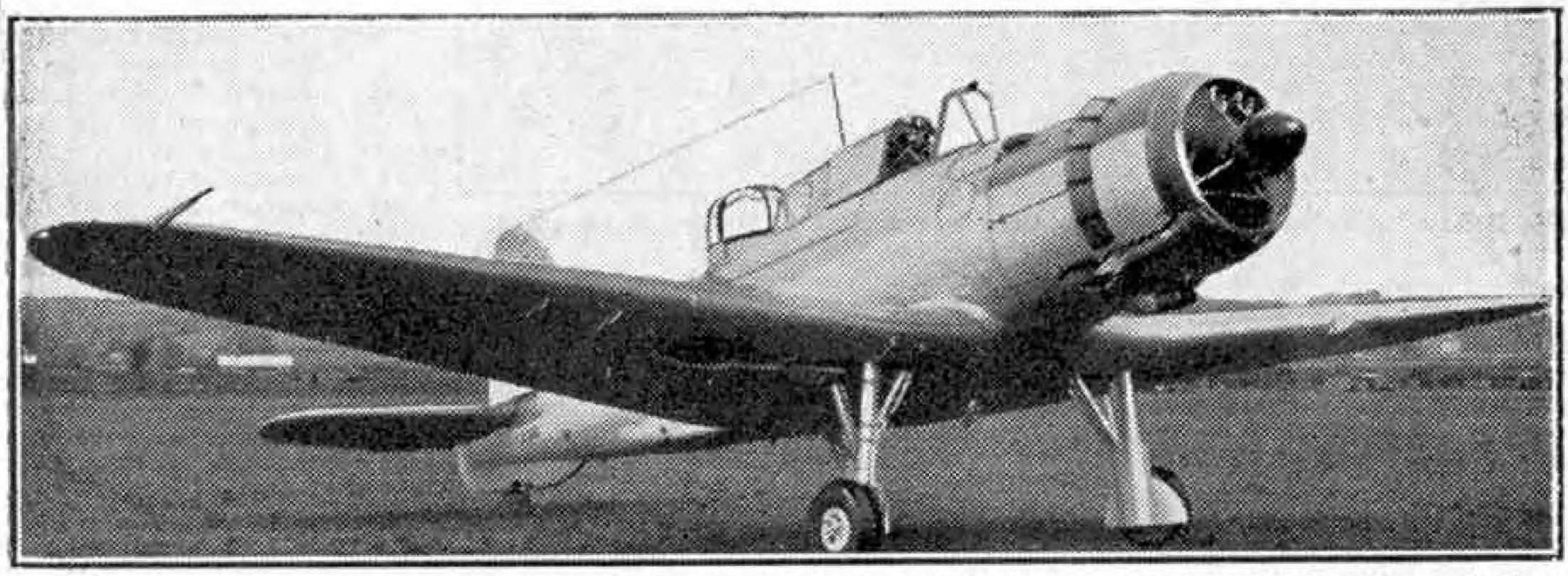
Also R.N.A.S. seaplanes from a little aircraft-carrier used to start from the Mediterranean, fly across Palestine, and try to drop bombs on the Hedjaz railway by which the Turks were transporting troops for the attack on the Suez Canal. That was the railway that the great Colonel Lawrence of Arabia spent so much time in blowing up at various places in its length. Those old seaplanes carried such a load of petrol and bombs that they could barely climb through the passes of the hills of Judea. The Turks used to sit on the tops of the hills and shoot down on them. But when they had dropped their bombs they came home more easily.



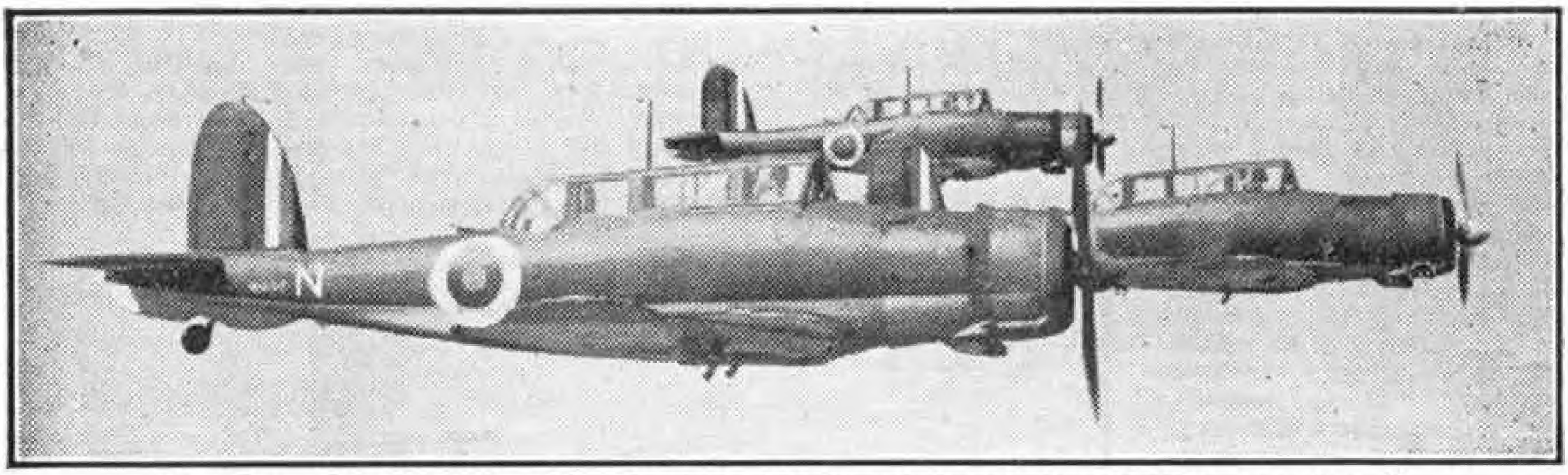
Fairey "Swordfish" torpedo, spotter, and reconnaissance aircraft. Photograph by courtesy of Charles E. Brown.

When the Navy's monitors were trying to bombard the enemy's positions on the coast of Belgium, the R.N.A.S. planes used to fly over the top of the target and signal by wireless where the shells were falling, but the Navy refused to take their spotting from the aeroplanes and preferred to take it from a gentleman standing on the top of Nieuport church tower waving flags. He could only see whether the shells were short or long, and naturally could not tell whether they were wide or on which side.

Similarly in the Mediterranean the Navy refused to use air escort with the convoys from Gibraltar to Malta and thence to Alexandria or up to Greece. The result was that they never got a convoy through without losing at least one ship and often they lost several. So the R.N.A.S. under Commodore Sueter, who had then been transferred from the Admiralty to the command of the Mediterranean, at Taranto, Italy, arranged to co-operate with the French convoys from Marseilles to Salonika, Greece. And all the time in which they were co-operating the French never lost a ship,



The Blackburn "Roc" two-seater Fighter shown as used from aircraft carriers. It can be fitted with a twin float undercarriage and used as a seaplane from other ships. Photograph by courtesy of Blackburn Aircraft Ltd.



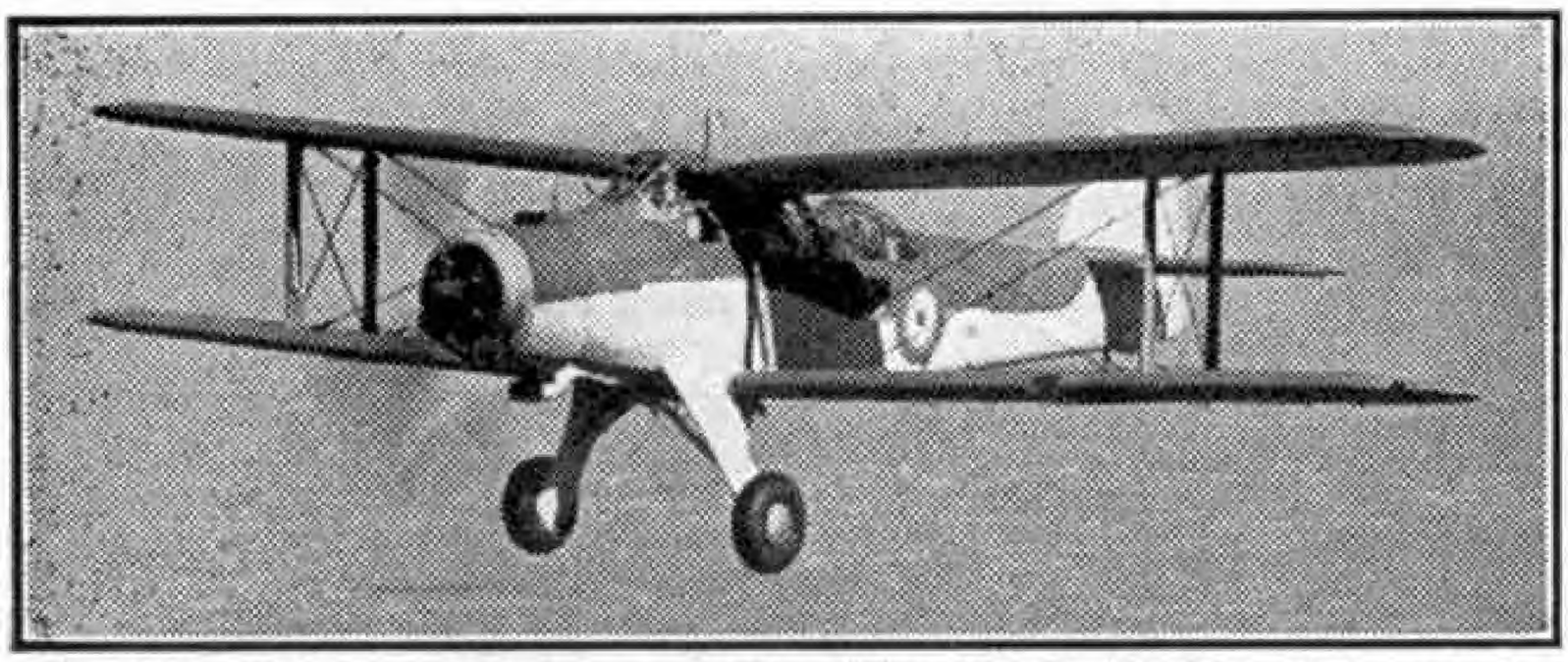
Blackburn "Skua" Fighter Dive-Bombers. Photograph by courtesy of "The Aeroplane."

and were never even attacked.

The R.N.A.S. also developed several types of fighting machines built by the Sopwith Company, which the Army had refused to consider. So during the great Battle of the Somme in 1916, when the Royal Flying Corps, which used to be the Military Wing, were having a terribly bad time, the R.N.A.S. was able to supply them with several squadrons of first-class fighters complete with pilots, and to lend them enough aeroplanes to equip several squadrons of their own.

Another activity in which the R.N.A.S. had great success was the development and operation of flying-boats. The credit for starting this branch should go to Lieut. John Porte, R.N., a Naval officer who was invalided out of the Service to die of tuberculosis, took to flying, got in touch with Glenn Curtiss, who made the first flying-boats in America, and so got Commodore Sueter to order them for the R.N.A.S. These boats did splendid anti-submarine patrol work round our coasts, and out over the North Sea. From them are descended our great "Sunderlands" and "Lerwicks" of to-day, which patrol most of the Atlantic.

Also the Navy had a lot of small airships built, called Blimps, which used to cruise up and down off the coast looking for submarines. If they found one they signalled to the nearest destroyers, which came along and often sank the submarines. An interesting thing is that the destroyer skippers were always ready to co-operate with the R.N.A.S. when the big ships would not. Thus the R.N.A.S. did a lot of splendid work although the Navy did not like them.



The Fairey "Albacore," successor to the "Swordfish." Photograph by courtesy of Fairey Aviation Co. Ltd.

Meanwhile there was a lot of agitation going on against the mis-handling of the R.F.C., with the result that political agitation forced the Admiralty and the War Office to hand over both their Air Services to a new Department called the Air Ministry, so that they were amalgamated into what we now call the Royal Air Force. That came into being on 1st April 1918, and until the Armistice in November it did all the work of the old R.N.A.S. and R.F.C. together.

Between the wars the younger officers of the Navy, who had seen what aircraft could do, began to want an air service of their own again. And several of the old admirals who had more intelligence than their colleagues also saw that the Navy ought to have its own air service.

Air Marshal Sir Hugh Trenchard, now Viscount Trenchard, who was Chief of the Air Staff from 1919 to 1930, seeing what was wanted, formed a branch of the R.A.F. which was officially called the Fleet Air Arm. This was only allowed to have aeroplanes which would go down the lifts of the aircraft-carriers. Naval officers were trained to fly by the R.A.F.; Naval ratings were trained to repair and maintain aircraft and engines. Other Naval officers were trained as observers, and ratings were trained as observers and wireless operators and gunners.

Special types of Naval machines were designed. There were deck-flying, or "ship-borne" fighters, reconnaissance machines, and torpedo-droppers. In fact everything was done to produce an efficient Air Arm for the Fleet. But all the big flying-boats and all the coastal-reconnaissance machines which worked off aerodromes, in fact every shore-based aeroplane which flew over the water, remained the property of the R.A.F.

Naturally a lot of the old admirals argued that everything that flew over water and was intended to take part in Naval operations, either co-operating with the Navy or against enemy shipping, should be the affair of the Navy. This argument lasted for twenty years.

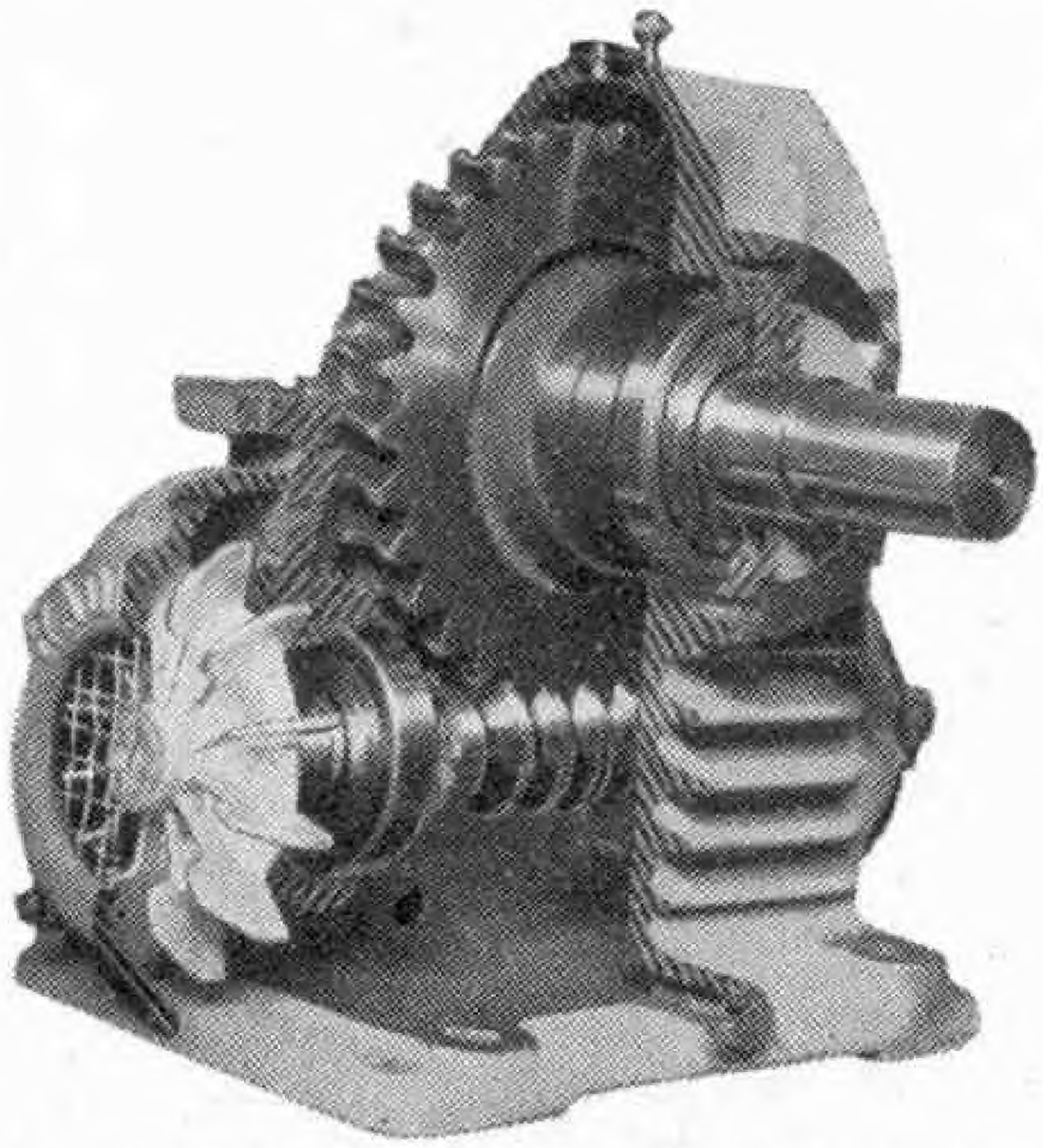
The Navy went on building seaplane-carriers and the Air Ministry supplied the aircraft to use on them. The aeroplanes were produced under the technical control of the Air Ministry, yet the Admiralty had to pay for them. It was a complicated system and led to endless squabbling, although the actual R.A.F. officers and men who were carried in the aircraft-carriers got along very well with the Navy.

The end of it was that the Government decided in 1938 that the Navy should have its Fleet Air Arm for its very own. So on 1st April 1939, twenty-one years after the R.N.A.S. had ceased to exist, the Navy regained possession of its own Air Service.

That was a good thing because, by sheer luck, the Navy had six months, in which to settle down to having its own Air Service before war began. It started enlisting men and giving commissions to civilian pilots, and training new pilots of its own, some of them to become permanent Naval officers and others Royal Naval Volunteer Reserve. You can always tell a Naval Air Service officer by the fact that he has a little gold "A" in the middle of the executive curl in the gold lace on his cuff.

Everyone knows what splendid work the Naval Air Service has done since (*Continued on page 122*)

Testing a Worm Reducer Unit



A sectionalised "Radicon" Worm Reducer, showing the disposition of the worm, the worm wheel, the oil flingers and the cooling fan. Photograph by courtesy of David Brown and Sons (Hudd) Ltd.

THE illustration on our front cover shows a *"Radicon"* worm reducer unit, coupled to a motor on a common bedplate, being tested under load at the works of David Brown and Sons (Hudd) Ltd., Huddersfield.

The worm shaft is coupled to the motor shaft through a flexible coupling, and the worm wheel, above the worm and with its shaft at right angles to the worm, is coupled through another flexible coupling to the drum of a water-cooled Prony brake. The *"Radicon"* unit is provided with ribs for cooling—vertical ribs on the upper part of the case where natural convection is used, horizontal ribs on the lower part where artificial convection is provided by means of a fan draught. The cowl projects air horizontally over the ribs from a fan fixed on the worm shaft.

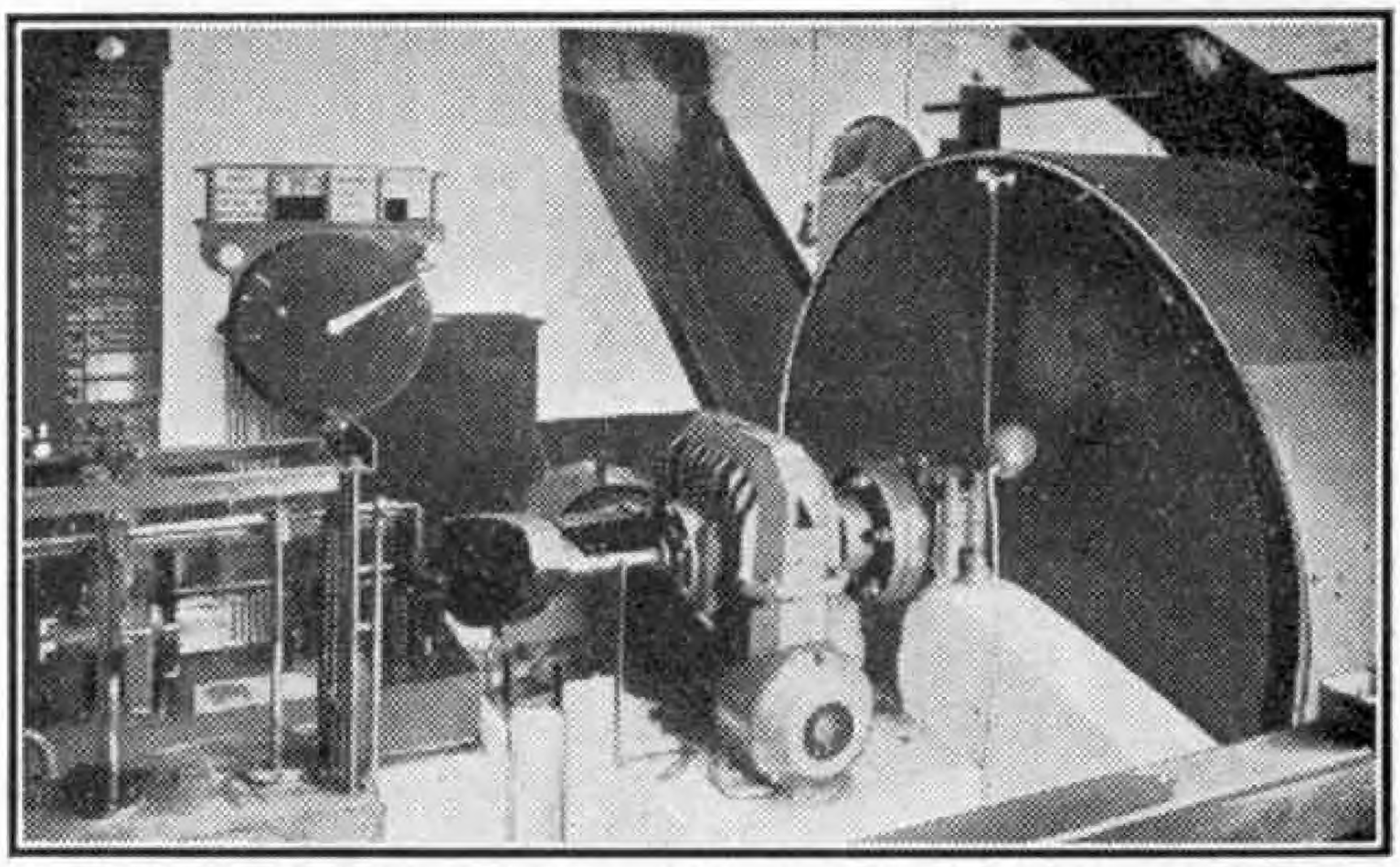
The brake consists of a rotating drum running between two floating, bonded asbestos-lined shoes. The shoes carry pivoted arms which support the brake load. The swinging weight carrier seen on the right carries loose cast iron weights; the left-hand side arms are connected to a spring balance supported on a frame, so that the total load on the brake is the sum of the loose weights and the spring balance pull. The brake torque is then this load multiplied by the radial distance of the pins at the ends of the arms from the axis of the drum. The vertical cylinder seen in the spring balance frame is an oil dash-pot to damp out vibrations.

Brake load is applied by pulling the two shoes together by handwheels operating on long bolts. When the test is in progress the brake shoes are tightened down sufficiently to permit the drum to run at the required speed and to enable the frictional force between the drum and the shoes to lift the load.

The work lost in friction is converted into heat, which is carried away by water circulating through the drum and both the shoes. Brake horsepower is calculated from the brake torque and the brake drum speed; this is also known as the output horsepower.

Input horsepower is obtained from the motor and, in this case, is measured electrically in watts. The motor makers know the motor efficiency, and by using this value together with the watt readings, the horsepower delivered to the worm shaft can be calculated.

(Continued on page 122)



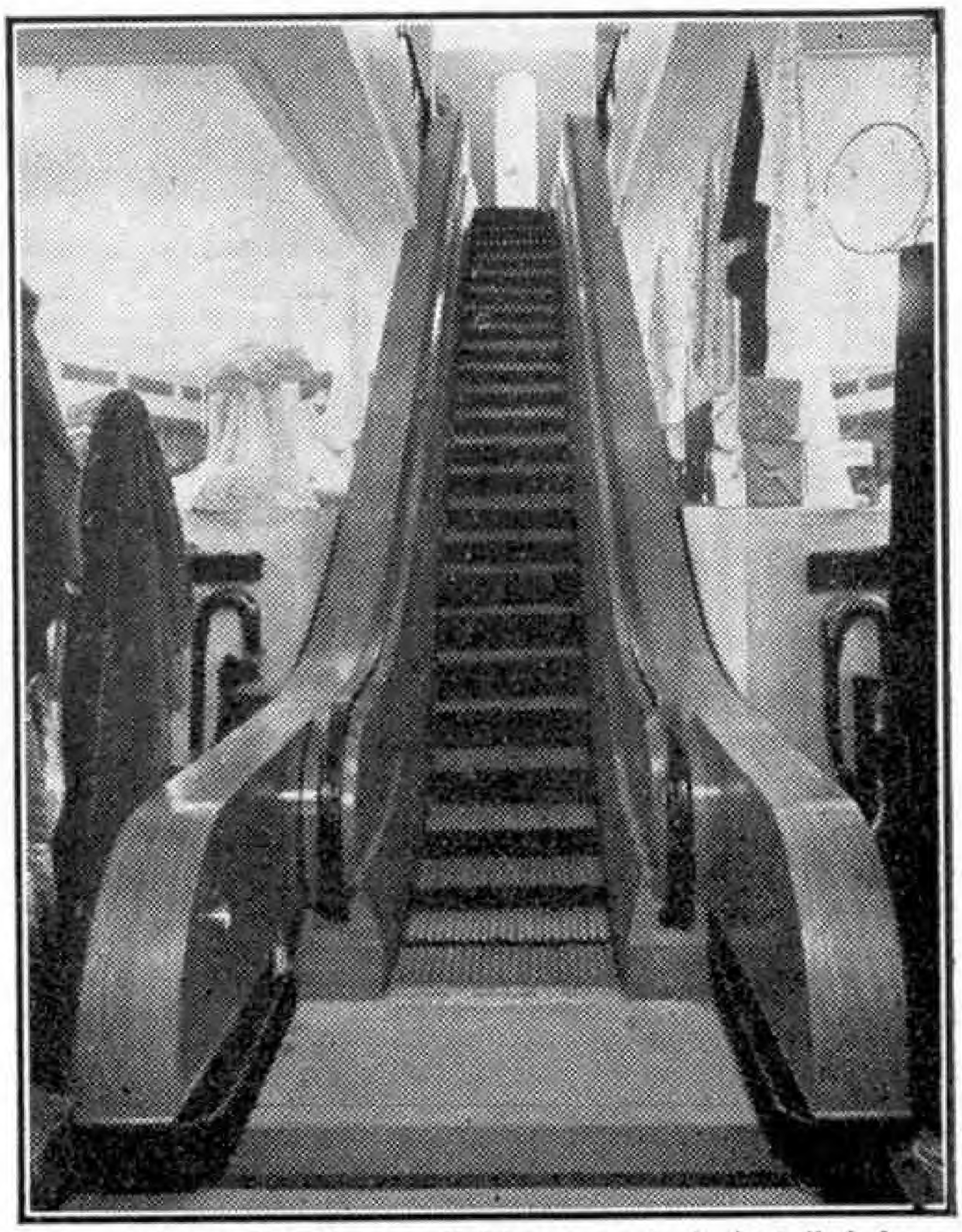
A "Radicon" Reducer used for a colliery electrical winder. It takes the load from the 90 h.p. motor, running at 960 r.p.m., to the drum, which runs at 40 r.p.m. This set makes 120 reversals per hour. The rope speed is 1,003 ft. per min.

Escalators in Department Stores

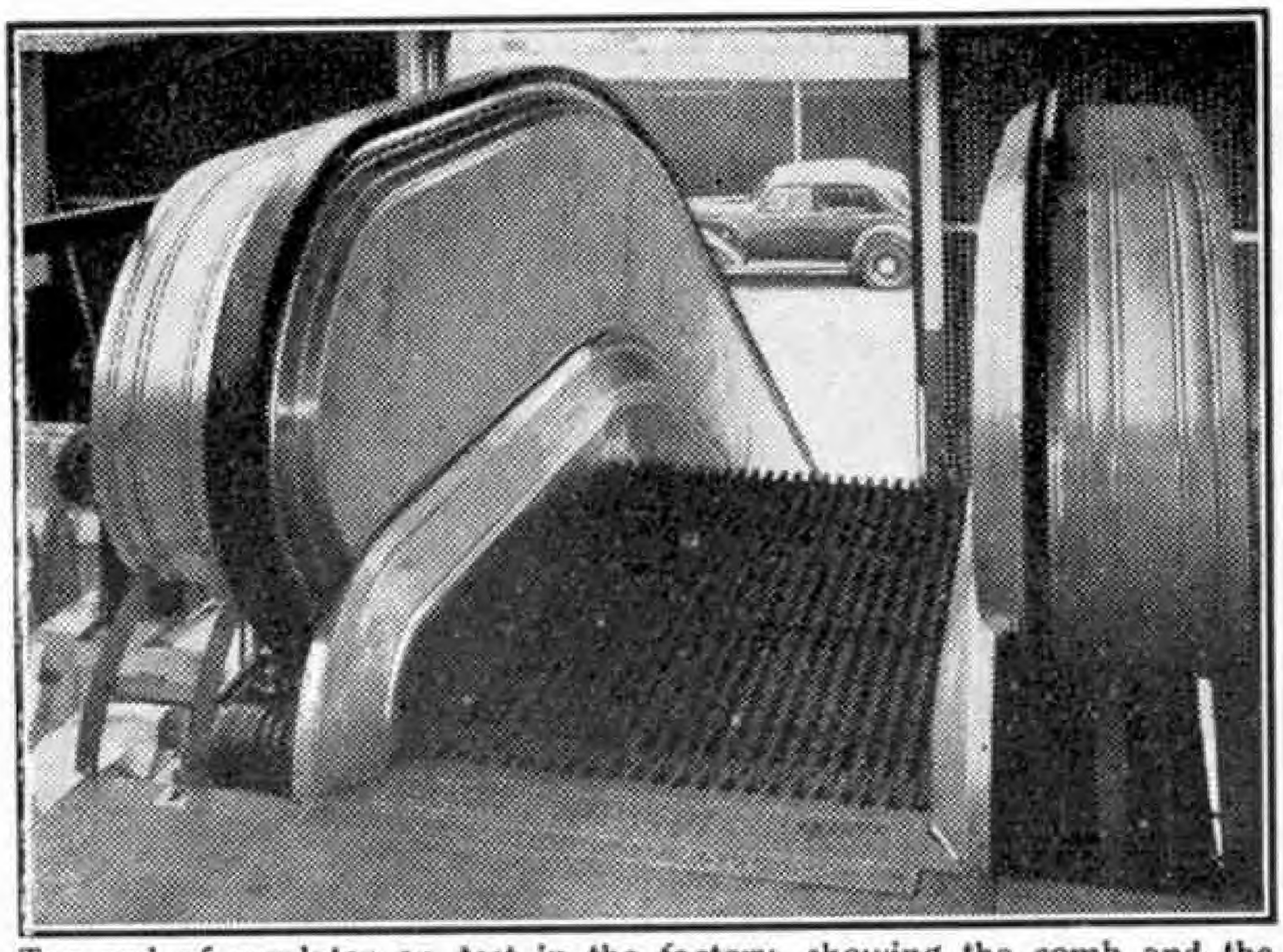
THE escalator or moving stairway may be said to combine the advantages of the staircase and the lift. It can handle a far greater number of passengers per hour than the lift, and it has also many other features in its favour.

The first escalator for passengers was installed at the Paris Exposition of 1900 where, as a side show, it attracted great attention and aroused widespread comment, favourable and otherwise. Some people clearly were afraid of it, but competent judges quickly realised its great possibilities. A little later a similar escalator was exhibited at the Crystal Palace, London, where large numbers of people sampled its thrills for a penny a trip.

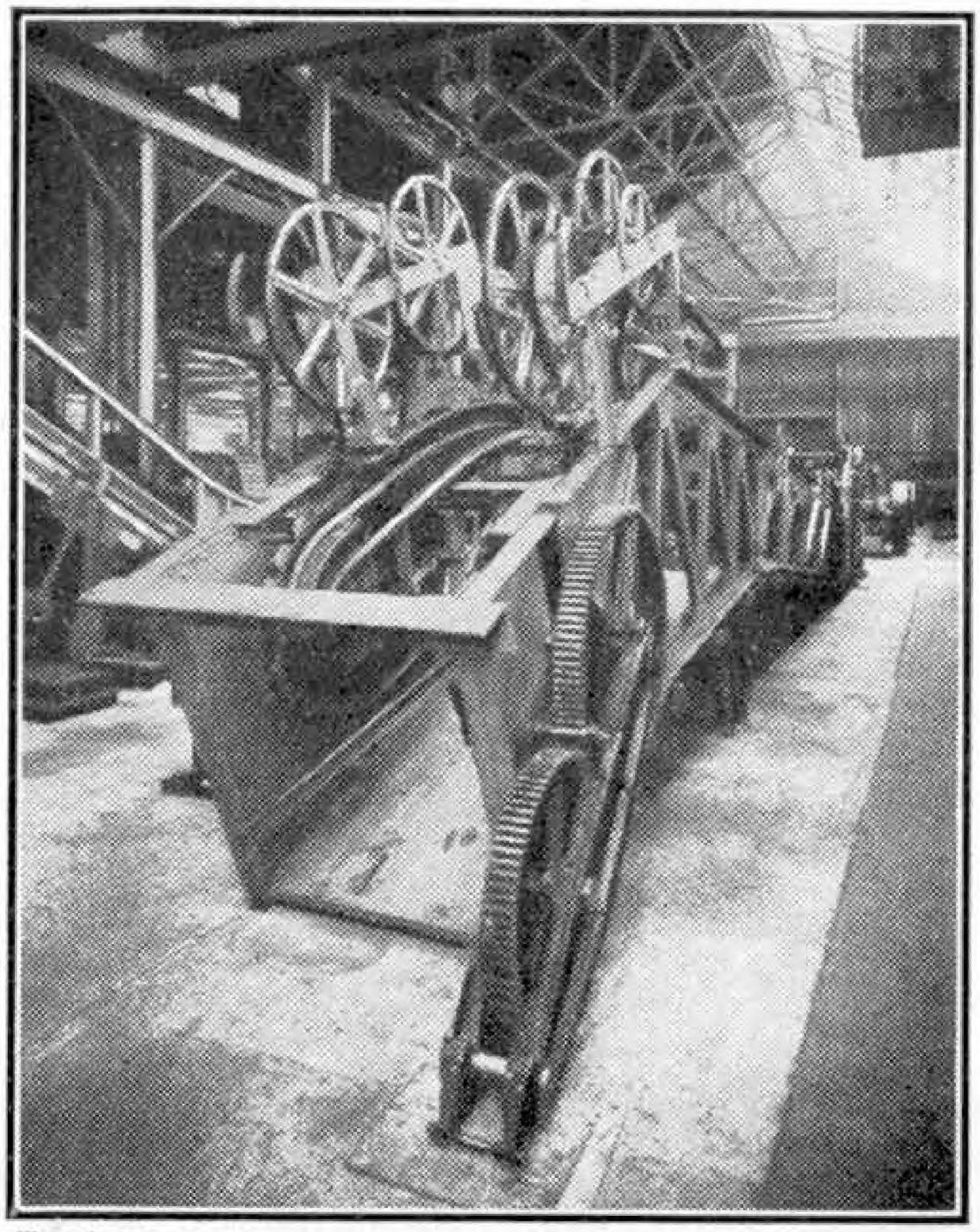
In essentials an escalator consists of a series of narrow platforms arranged so as to form steps and mounted on an endless driving band in the form of roller chains. These chains pass over large sprockets that are driven by an electric motor below the floor at the top of the stairway. The steps may be regarded as small trucks carried on four rollers and pivoted in such a manner as to remain always in a level position. On the treads are raised strips, or cleats, set in the direction of movement. At the landings the cleats pass between the teeth of a steel "comb" and the steps then pass on to complete their return journey below the framework. This arrangement forms a valuable protective device for passengers; for if they fail to step off at the landing they are gently and safely "combed off." A handrail on each side of the stairway moves at the same speed as the steps. There are also other safety devices in the form of power-operated brakes and a governor to control the speed. In addition, at the top and bottom of the stairway there are emergency hand-operated switches, by which the escalator can be stopped immediately. A further point of importance is that if for any reason the electric supply fails, the escalators stop and so become stationary staircases.



An escalator, fitted with light-ray control, installed in a large store by J. and E. Hall Ltd., to whom we are indebted for the illustrations to this article.



Top end of escalator on test in the factory, showing the comb and the drive for the handrail.



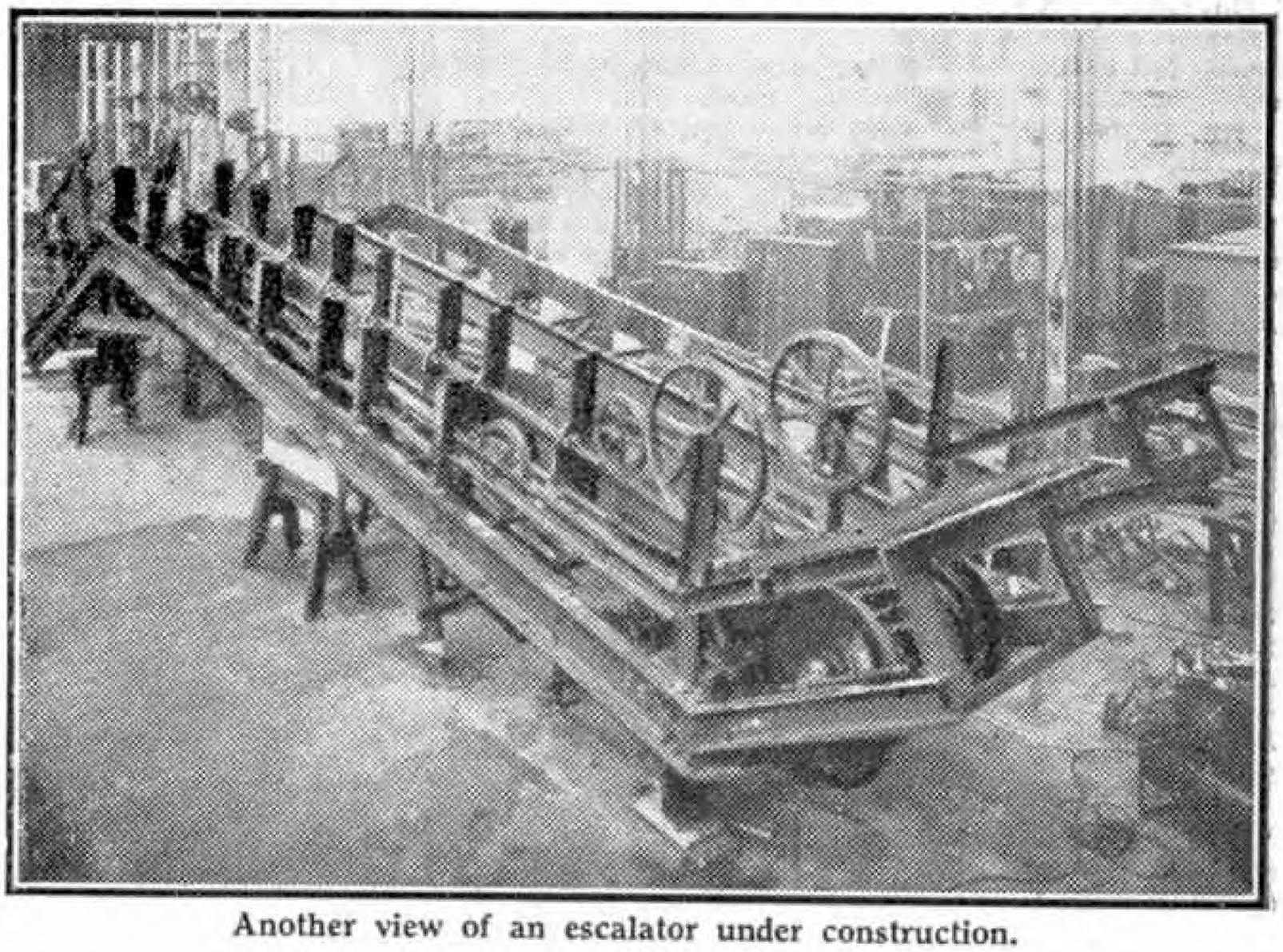
Escalator under construction, showing gear drive, curved tracks and sprockets for driving. The end in the foreground is the part that rests on the upper floor.

The running cost of an escalator is surprisingly low, the average current consumption of one with a capacity of 6,000 persons per hour being not more than 2 kw. With current at one penny per B.O.T. unit the cost therefore would be under twopence per hour.

Most of us are familiar with the escalators that for many years have been such an important feature of the London Underground stations. A more recent development is the installation of escalators in large department stores. The ordinary type of store lift is capable of handling effectively some 400 persons per hour; an escalator of even small size, that is with narrow steps, can deal with 10 times that number. The type usually fitted has a carrying capacity of 6,000 persons per hour. From the shopkeeper's point of view one of the many good features of an escalator is that it is open, so that customers, as they are carried slowly forward, see the goods around them in each department through which they pass. In the closed lift they see nothing. The continuous running of the escalator does away with the waiting for the lift that is apt to lead to congestion at busy times, and it tends to keep the crowds continually on the move. As a rule store escalators are reversible so that they can be set to run in either direction.

The number of people visiting a store varies greatly at different hours of the day, and it is possible to effect economy by running the escalators during quiet periods at "cruising" speed, which is about half the normal speed. A particularly interesting feature of some recently installed escalators is the two-speed light-ray control. This control causes the escalator to run at half speed until the light ray is interrupted by a passenger. An increase to full speed then occurs, and is maintained for a sufficient length of time to ensure that the person whose passing broke the ray has left the top of the escalator. Half speed is then restored, unless in the meantime the ray has been broken by other passengers.

The casings of store escalators lend themselves well to decorative effects, and beautiful results are obtained by the use of a variety of woods such as Australian walnut, weathered sycamore, and oak.



Another view of an escalator under construction.

Railway News

The New S.R. Electric Locomotive

The S.R. have recently produced the first of a new type of electric locomotive, designed by Mr. Alfred Raworth, Chief Electrical Engineer, for the operation of both freight and passenger services over the company's electrified lines. The mechanical parts of the locomotive have been constructed in the company's works at Ashford to the design of Mr. O. V. Bulleid, Chief Mechanical Engineer. Technical test runs on the main Brighton line have been completed and service trials with passenger trains by day and with freight trains by night also have been made. The locomotive is capable of dealing with freight trains of 1,000 tons in weight and can also haul passenger trains at speeds up to 75 m.p.h.

We hope to include an illustrated article on this locomotive in an early issue of the "*M.M.*"

Making up Time with 700-ton Trains

A run was recently recorded behind the rebuilt L.N.E.R. 4–6–4 No. 10000 hauling a 21-coach train weighing about 710 tons, including a very full complement of passengers, luggage, &c. This was from Peterborough to King's Cross on the relief "*Flying Scotsman*," and the log presents some strange features, as the speeds on the level and over moderate undulations were higher than those attained down the principal descents, when steam was almost shut off in order to keep within the present 60 m.p.h. limit. Interesting comparisons may be made with a trip by the same train with a similarly huge load, when one of the original 180-lb. per sq. in. "A1" "Pacifics" No. 2545 "*Diamond Jubilee*," since converted to the "A3" Class, gave a fine performance that necessitated being worked hard.

No. 10000 with her vast boiler power, 250 lb. per sq. in. pressure, Kylchap blast pipe and double chimney, attained 63–64 m.p.h. on the level past Holme. The first 9 miles from the start were covered in 12 min. 3 sec., and then 52 m.p.h. was averaged up the 1 in 200 to Abbots Ripton, after which a decided easing too; place and the pace down to Huntingdon and beyond was very leisurely. After St. Neots the regulator was well opened, but an early cut-off was maintained, with the result that an average of 61 m.p.h. was sustained over the undulating and largely adverse 16 miles on to Three Counties. To this point 40¾ miles had taken 46¼ min., and 4 min. of a late start had been regained. "*Diamond Jubilee's*" time to Three Counties was almost exactly the same, although her average after St. Neots was not more than 56½ m.p.h. The start and climb past Abbots Ripton had been slightly slower, but the rates of travel downhill to Huntingdon and forward to the 52nd mile post were a good deal faster.

Up the 7 miles at 1 in 264–200 to Stevenage, No. 10000 averaged 46 m.p.h., although slowed by signal north of Hitchin, compared with No. 2545's mean speed of 42.6 unchecked, the 4–6–4 putting up a grand climb with this vast train on the 1 in 200 and maintaining about 44 m.p.h., after accelerating from the delay. By Knebworth the bigger engine had the advantage of 1¼ min. actual, or 2¼ min. net, but severe signal slacks and stops followed and a gentle descent was made from Potters Bar.

The "A1," less delayed, took advantage of the downhill possibilities, although not travelling as fast as on normal peacetime runs, so that the through net times in each case were 88–89 min., representing a gain of over 5 min. on present schedule with trains weighing more than many fast goods services.

London-Bristol Main Line Centenary

The G.W.R. broad gauge line from London to Bristol, via Bath, had just been completed throughout 100 years ago. In 1842 it was the longest stretch of British railway belonging to one company, and today it is the only trunk route of such length owned then and now by a railway having the same title continuously.

The new Southern Railway electric locomotive described on this page. Photograph by courtesy of the company.

The outstanding engineering feat during construction was Box Tunnel in Wiltshire, which is 3,212 yds. long and is entirely straight, so that although approaching two miles in length it is sometimes possible to see daylight at the other end from either portal. It took nearly five years to build and in its early days was the longest tunnel in the world, though having the shortest name.

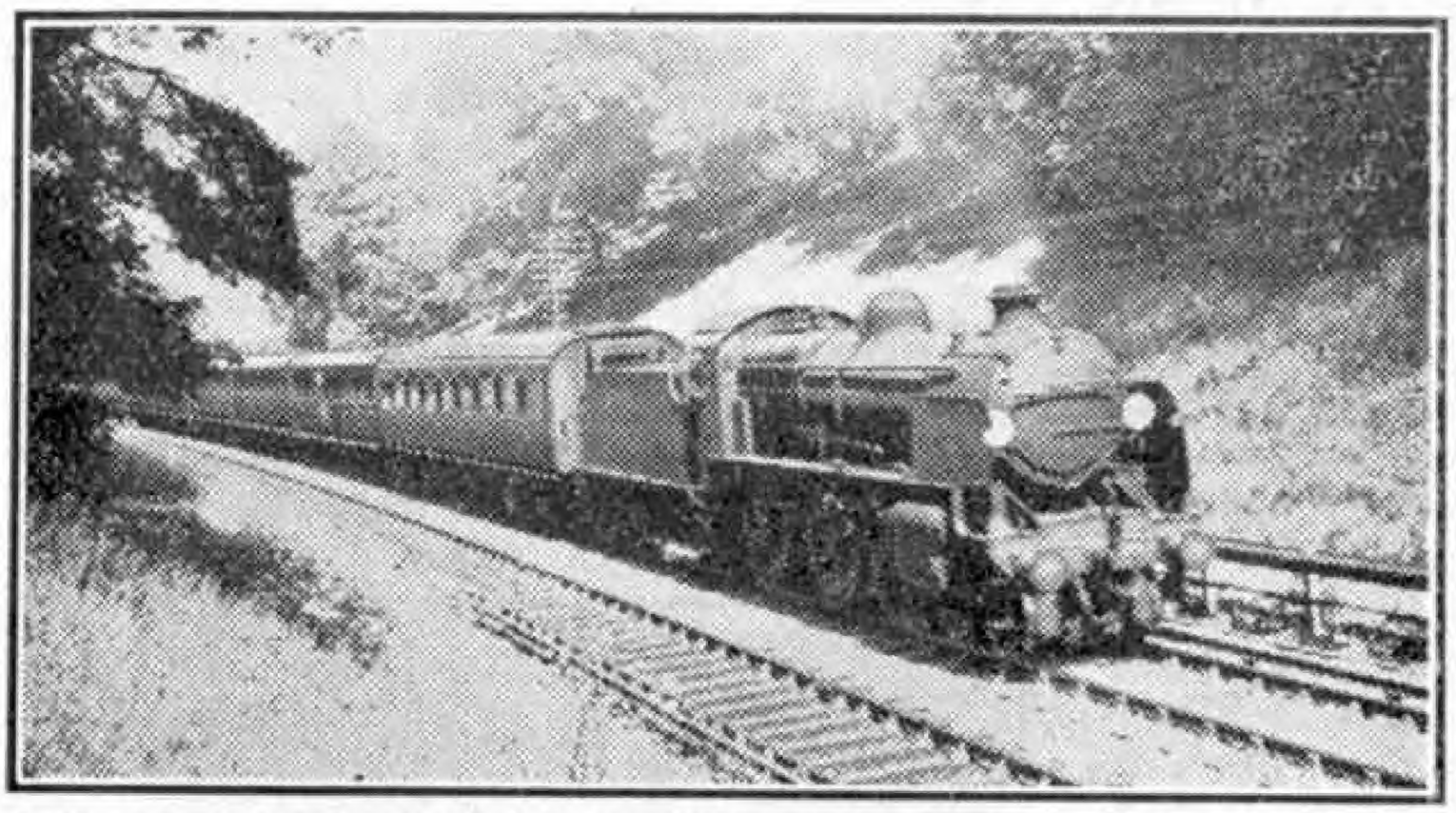
Departmental Locomotives

It has been the custom on most of the British railways for many years to employ a small number of engines entirely within their own works and storage yards. These are known as "Service" or "Departmental" locomotives, and they do not usually figure in lists of rolling stock available for traffic. As a matter of fact they are frequently ancient machines that have interesting histories.

For instance, looking over lists of departmental engines that have recently been in service on the S.R., we note a curious 4–2–4 single-driver tank with a small inspection saloon incorporated in the unit immediately behind the footplate and bunker. It was built for the former London and South Western Railway in 1900 as No. 733, with two outside cylinders, and was used by the late Mr. Dugald Drummond, Locomotive Superintendent, as an official inspection

car for running on main lines if necessary. As S.R. No. 58S it was withdrawn in 1940.

Another S.R. departmental engine is No. 77S, an 0–4–0T employed in a sleeper yard. This engine was built in 1907 as a 2–2–0 with the number 745, for running attached to an open or centre-corridor bogie coach as a push-and-pull rail motor unit. For some years its number was 0745, as it was put on the duplicate list on account of the arrival of Urie 4–6–0 No. 745.



A "special" headed by 2-6-0 No. 1610 on the Portsmouth line of the S.R. before electrification. Photograph by O. S. Nock.

Other examples are three of Stroudley's famous "Terrier" 0–6–0T design, originated at Brighton 60–65 years ago. Their present numbers are 380S, 515S and 680S. The first of these, once No. 82 "*Boxhill*," is practically in its "A1" class condition and is employed at Brighton works. The second is "*Alx*," a rebuild that has seen recent service in the Isle of Wight and is now used for shunting at the company's carriage works. No. 680S, which began life as London, Brighton and South Coast No. 54 "*Waddon*," is similarly employed. This engine was sold to the former South Eastern and Chatham Railway in 1904 and merged into S.R. service stock from that company, having in the interim acquired an Ashford boiler.

We illustrate an interesting old 0–4–2T that is now on the L.M.S. departmental locomotive list and is fitted with a light crane for works duties. For many years it was No. 29A on the former North London system, and it was constructed as an 0–4–0T by Sharp, Stewart and Co. Ltd., over 80 years ago for the North and South-west Junction Railway.

Among L.N.E.R. service engines are three outside cylinder 0–6–0Ts with 4 ft. wheels that were built at Lincoln about 70 years ago. Since 1894 they have been employed at the G.E. section plant carrying a 3-ton jib crane for handling materials. These are not now numbered, but are known as "B," "C," and "D," respectively.

Another interesting L.N.E.R. example is a typical Stirling G.N. saddle tank with enlarged cab. This was constructed by Neilson and Co. Ltd. in 1891, having 4 ft. 8 in. wheels and 17½ in. cylinders. In service the engine was No. 920. It was withdrawn in 1928 and, as was Doncaster custom from time to time, it was not scrapped but put to new work as service shunter with the duplicate list number 4800. It was subsequently rebuilt to the more modern class "J55," and in 1938 when the "Green Arrow" class were being built and taking 48xx numbers, this works locomotive became No. 4990.

Other tank and tender engines that have been withdrawn are also retained for service purposes by the Engineering Departments, being used for pumping, brake testing and the like.

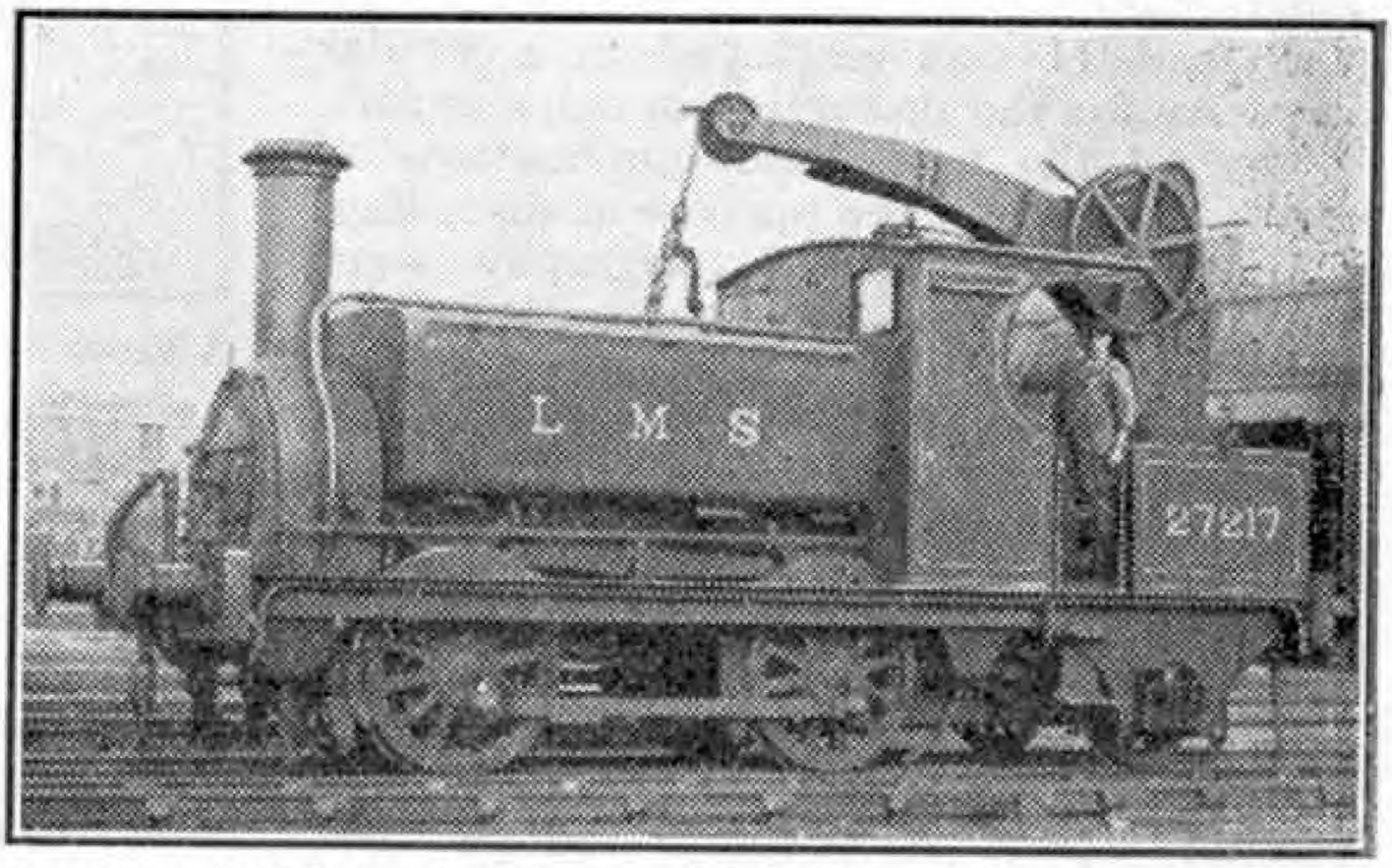
Locomotive News

On the G.W.R. main line near London engines belonging to all four groups were lately seen on freight trains. They included S.R. 4–6–0s Nos. 478 and 2330; L.N.E.R. 2–8–0s Nos. 6562, 6573; L.M.S. 0–6–0s Nos. 3081, 3516 and 3545, and a variety of the home company's locomotive stud from depots far and near. One of the former Midland class 2F 0–6–0s noted there on another occasion in a particularly dirty condition had a "Victory V" chalked on the tender amid the grime, with the following legend: "*For Sale, or would exchange for a Spitfire in going order.*"

L.M.S. news to hand includes a note on the appearance of considerably more standard 2–8–0 and ex-L.N.W. 0–8–0 freight locomotives on the Midland division of the Company.

We note that six "George the Fifth" type 4–4–0 express locomotives are still running in the Chester-North Wales region, and the Midland division "Garratts," articulated mineral engines, now operate over a considerably wider range, such as to Peterborough and York. S.R. 4–4–0s of several former South Eastern and Chatham and London and South Western classes are working on the Midland West of England route as well as to Bath and on the Somerset and Dorset Joint system.

On New Year's Day the fourth Southern "Pacific," No. 21C 4, after trial runs in Hampshire and the London area, was brought up to Charing Cross station, London, which usually sees no larger engines than "King Arthurs," for the official naming ceremony, Sir Percy Bates, Chairman of the shipping company after which the engine is named, unveiled the handsome circular plaques bearing the title "*Cunard White Star.*" The coloured house flags of the two companies appear in the centre with the words "*Merchant Navy Class*" horizontally, as on the locomotives of this class previously put into service.



A veteran L.M.S. locomotive now fitted with a light crane for works duties. It was built more than 80 years ago.

Copper—The Story of the Red Metal

III. Uses in the Modern World

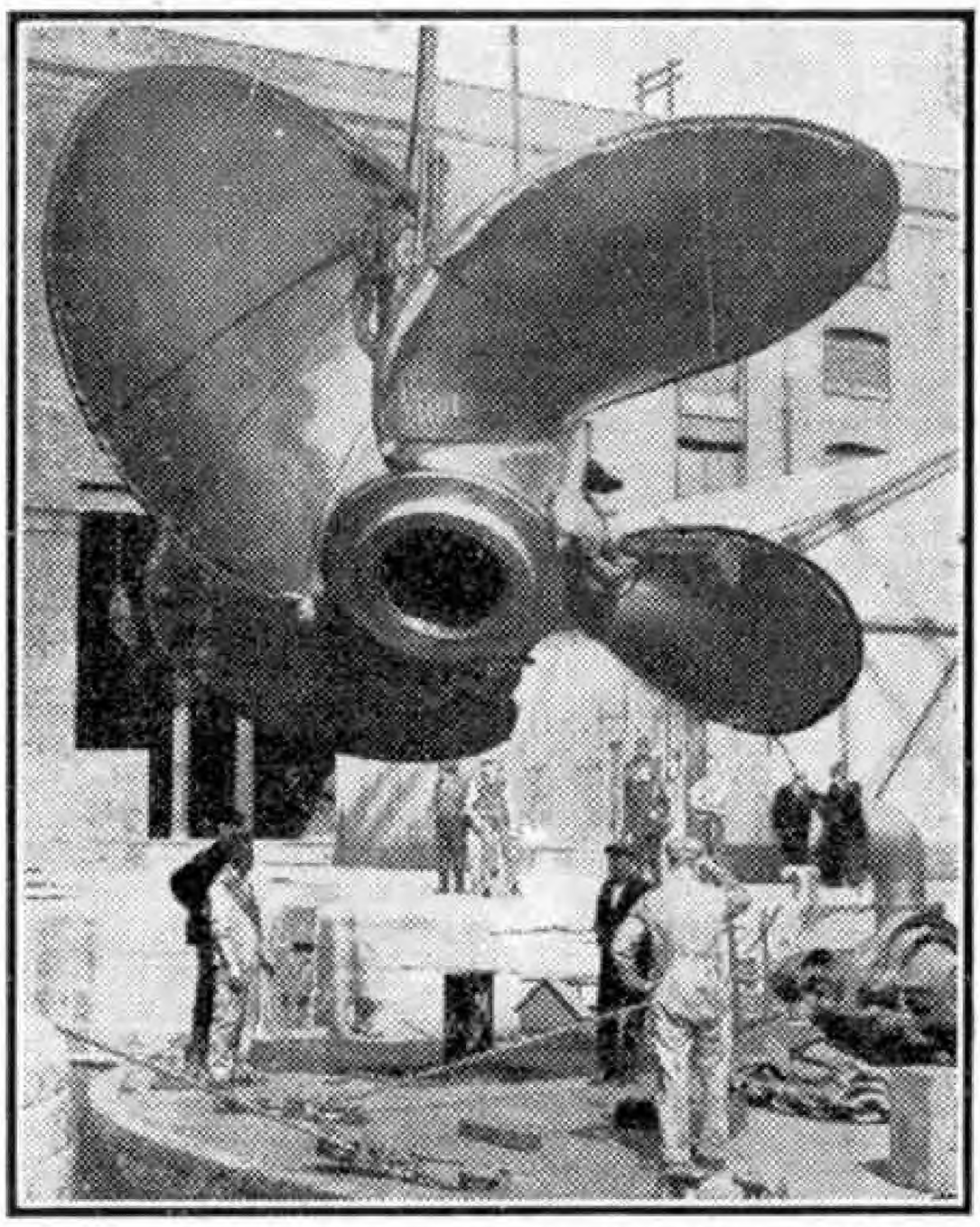
THE rapid progress of electrical engineering has been due to a great extent to the existence of copper; indeed without this metal the vast electrical industry of to-day probably would not have existed.

Copper was intimately connected with the discovery of some of the very earliest electrical effects, such as that made by Galvani in 1786, when he noticed the curious behaviour of some frogs' legs hung by means of a copper hook from an iron railing. In 1799 Volta made the first electric battery, known as "Volta's Pile," which he described for the first time in 1800. This, like many other batteries that followed, employed copper as an active element, for it consisted of discs of copper and zinc placed one upon the other with a layer of wet cloth between each pair. In 1809 John Children constructed a battery having 20 pairs of plates of copper and zinc each plate being 6 ft. long and 2 ft. 8 in. wide. It was with this battery that Children conducted experiments to determine the best conductor of electricity, and thus was probably one of the first to give scientific proof of the superiority of copper for this purpose.

Copper was used also for lightning conductors for the protection of buildings, and in 1811 was employed in a similar capacity for the protection of ships' masts.

One of the first useful applications of electricity was for the purpose of signalling, and many systems of telegraphy were invented and tried out before Cooke and Wheatstone in 1873 installed, on a section of the London and North-Western Railway between Euston and Chalk Farm, the first electric telegraph to be put into commercial use. No sooner had the telegraph been established successfully on land than attempts were made to adapt it for submarine working. In 1866, after many unsuccessful attempts, a satisfactory cable was laid across the Atlantic and put into commercial operation. Over 365 tons of copper were required for the manufacture of the conductor of this cable.

Although the electric battery sufficed for the supply of current for telegraphic purposes, the need for a more abundant source of supply was appreciated, and considerable attention given to the development of electrical machines. The electro-magnetic investigations of such men as Oersted, Ampere, Sturgeon and Arago paved the way for the greatest of all discoveries, those of Faraday in 1831.



A 35-ton bronze propeller for the liner "Queen Mary."

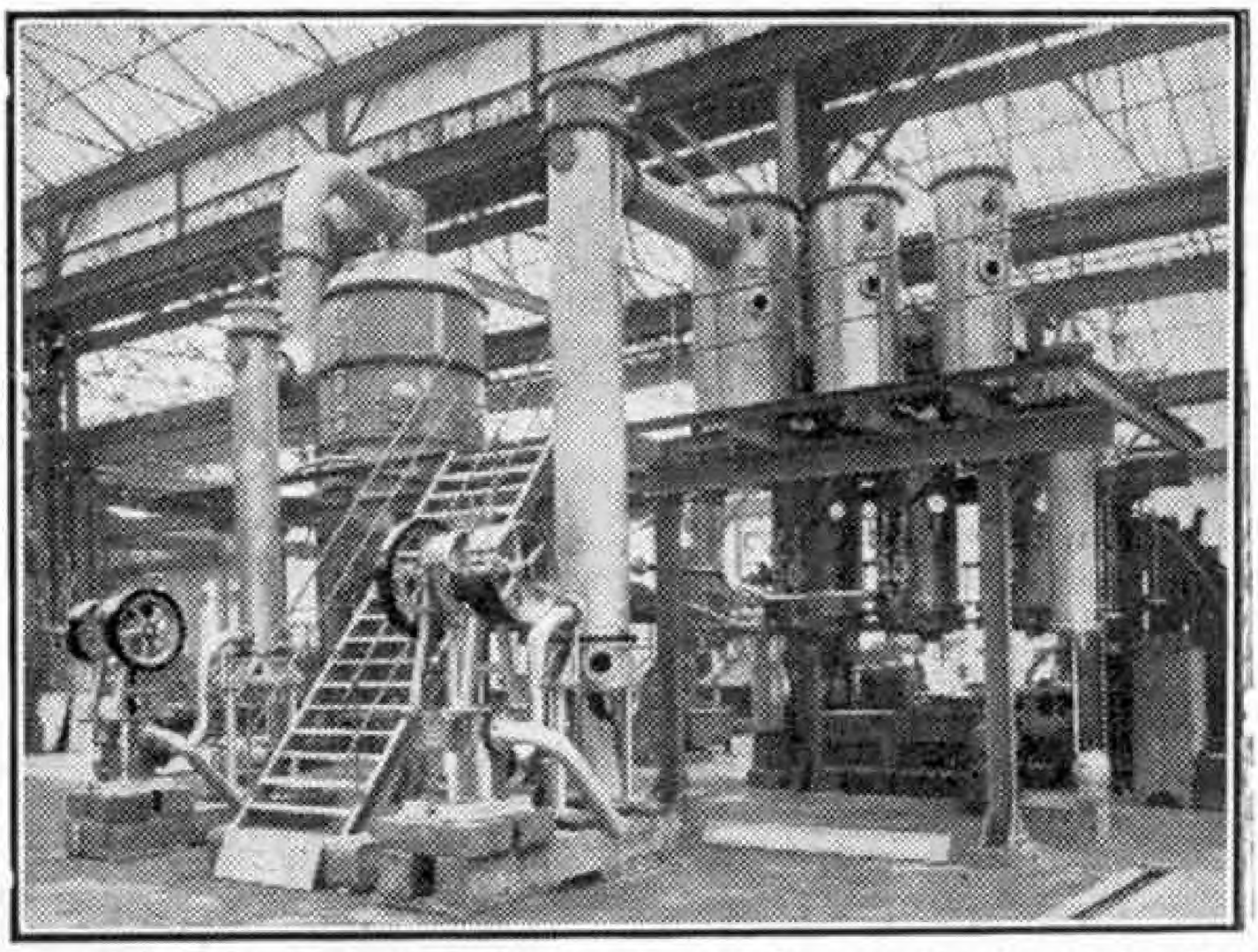
It was in that year that he discovered the effects described by him as "Volta-electric" and "magneto-electric induction," one or other of which is the underlying principle of almost every electrical apparatus or machine since constructed. The action of electrical transformers and similar apparatus is based on Faraday's discovery of "electro-magnetic induction."

Along with the development of generation, numerous systems for the distribution of the current were devised. All of these used copper conductors either in the form of rod or wire, which material has been used almost exclusively for the purpose ever since. To-day many miles of copper wire may be required for the distribution of electricity within a single

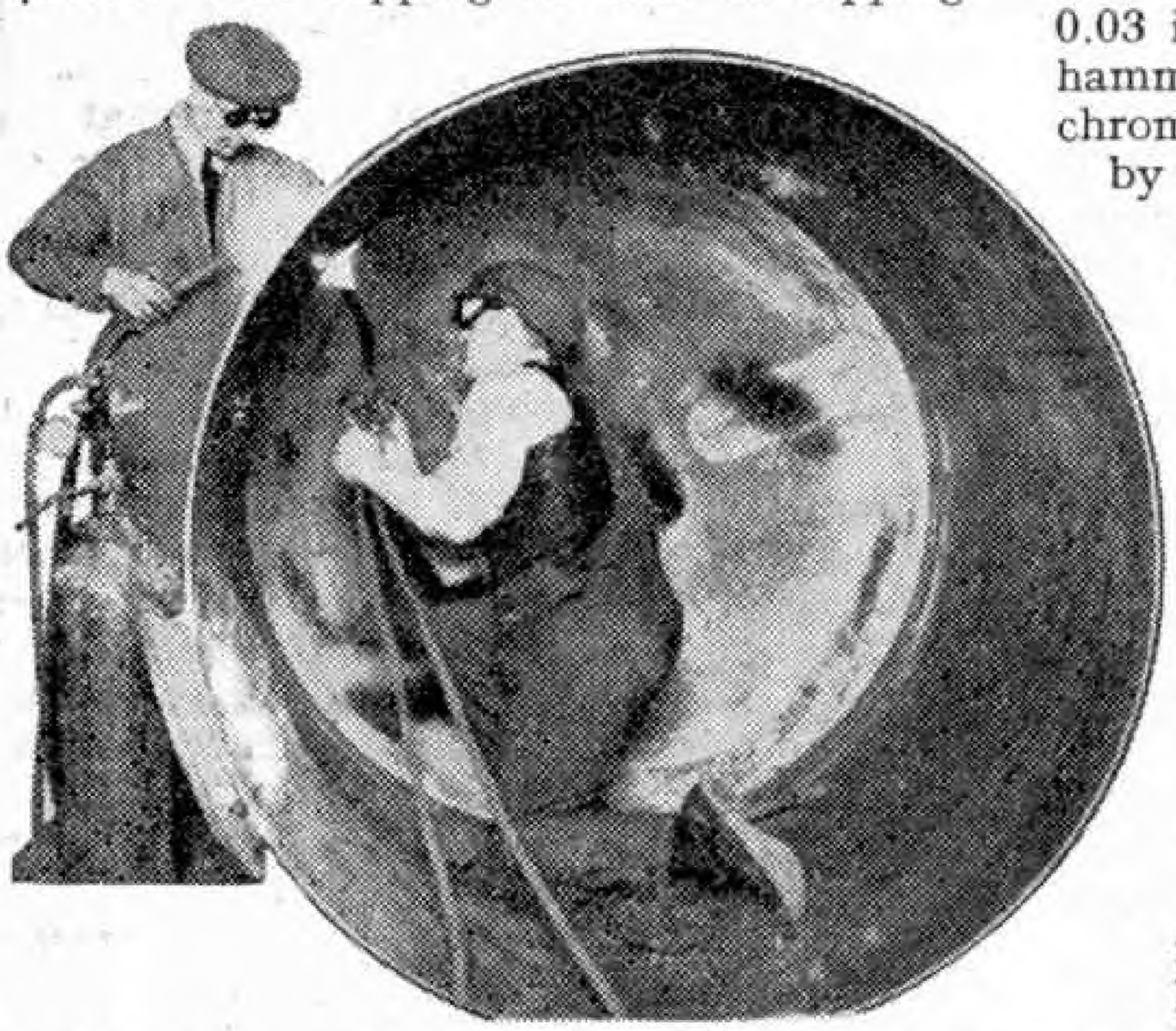
CORRECTION. — *By an unfortunate error the captions of two of the illustrations in last month's Copper article were transposed. The lower illustration on page 65 shows a typical spinning operation and the illustration on page 66 shows turning leaded nickel brass ("Silver bronze").*

building, and many thousands of tons of the metal are in continuous service in the form of both underground and overhead distribution cables in all parts of the world.

A large amount of copper is in use in chemical plant. The choice of the material of construction for such plant generally depends to a great extent on its corrosion resistance. In addition to such resistance copper possesses a variety of properties that further increase its suitability for such purposes. There are some processes which, considered purely from the standpoint of chemical resistance, would demand as constructional materials metals that are impracticable either on economical or mechanical grounds. In such cases it is a common procedure to use the chemically desirable metal as a lining on a backing metal with the necessary mechanical properties. Copper is widely used in such a manner as a base for coating with the more expensive metals, such as tin, silver, nickel and chromium. Four methods of tinning are in common use. Electro-deposition is generally used for small articles which are made the cathode in a bath of a suitable electrolyte for the time necessary to give the coating required. Hot dipping consists in dipping the copper, after suitable cleaning and fluxing, into a bath of molten tin. Wiping is the most commonly adopted process for tinning plant, which is usually too large for either of the foregoing methods to be employed. The copper is cleaned, heated and fluxed, and then molten tin is poured on and wiped over the surface. Finally there is spraying, in which a wire of tin is melted and sprayed on to the article from a gun by a current of air. Silver is sometimes coated on copper either by electro-deposition or by lining. In the latter process a complete lining is made of sheet silver of something like 0.03 in. in thickness, which is sweated or hammered on to the copper. Nickel and chromium coatings also may be applied by electro-deposition.



Plant for manufacturing solid tannin extract, showing the triple effect evaporator, finisher, and condenser, all of which are of copper. Photograph by courtesy of Blairs Limited.



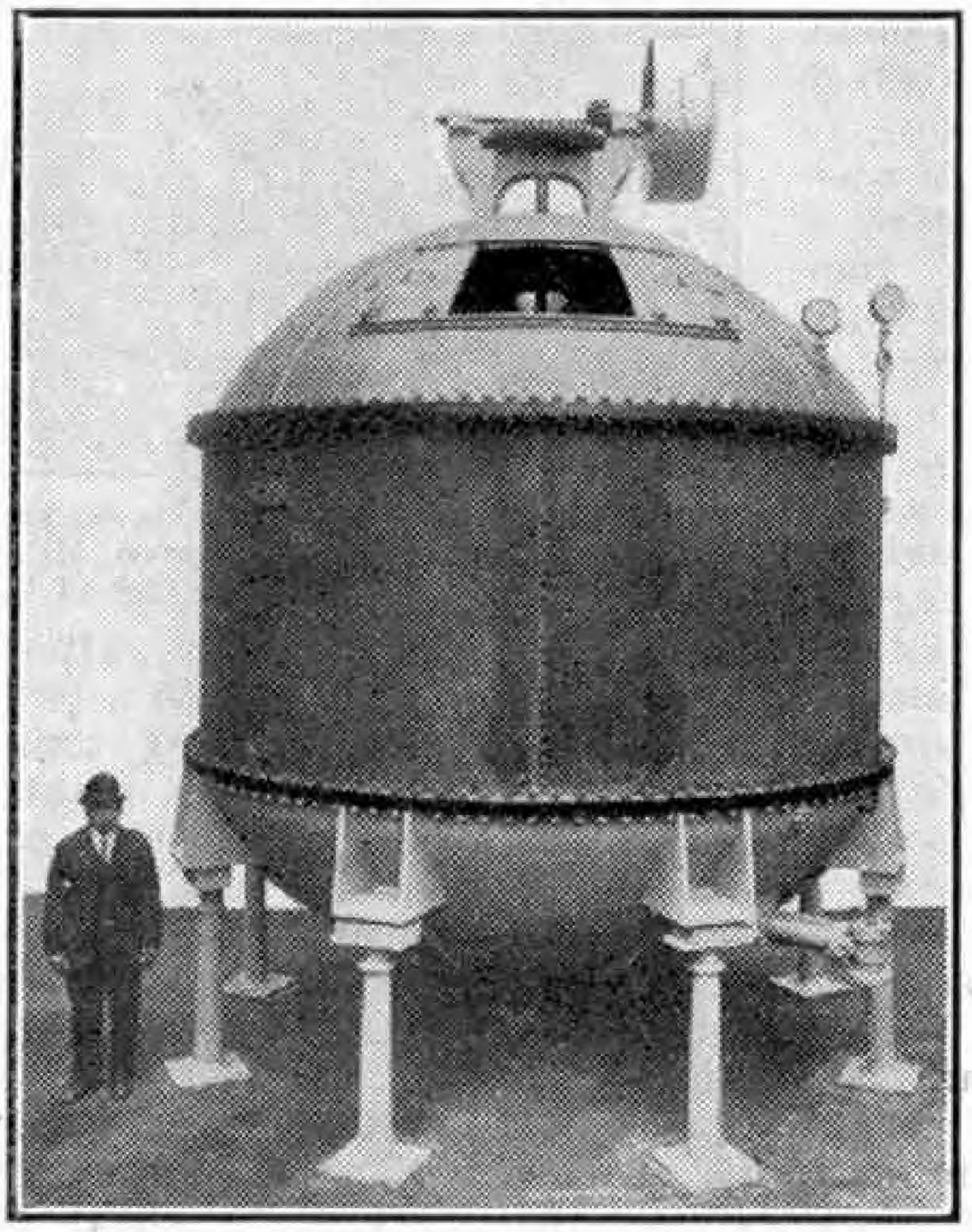
Welding copper tank of ⅜ in. metal. The operator inside is heating, while the other is welding. Photograph by courtesy of The British Oxygen Co. Ltd.

Copper and its alloys are very extensively used in the equipment for brewing, the distillation of spirits and the manufacture of industrial alcohol; for the preparation of fruit juices and confectionery; for sugar refining, and for the pasteurising of fresh milk and the manufacture of condensed and dried milk. Further applications are found in the pulp and paper industry, in many textile industries, and in the preparation of varnishes, resins and essential oils.

Copper is used almost exclusively for the construction of fire-boxes for locomotives throughout the British Empire and many other parts of the world, in contrast to the United States and Canada where steel is

preferred. The advantages of copper for this purpose are its high heat conductivity, its resistance to scale deposition, and its hardness and strength at the very high temperatures involved. In the ship-building industry copper and its alloys are used extensively in engines and their condensers, and also for propellers, bearings and fittings of every kind, since it is very necessary that such parts shall not deteriorate or become corroded when exposed to the salt-laden atmosphere prevailing at sea. The metal is of great importance in the transport industry for the manufacture of road and railway vehicles. In the construction of motor cars, in addition to the copper used in such vital parts as the ignition, starting and lighting systems, it is required also for radiators, oil, petrol and hydraulic brake pipes, bearings, gaskets and numerous brass pressings and hot stampings.

In the home, copper utensils are familiar in every kitchen, and the metal plays an important part in the equipment of bathrooms.



A large brewing copper. The inner copper bottom was hammered out from a single sheet of copper. Photograph by courtesy of Blairs Limited.

And now we come to the end of our all too brief survey of the production and use of copper. We will end with a summary of some of the special virtues of the red metal.

In many cases, particularly in the electrical industry, metal of the highest possible conductivity is required, and for such purposes copper having a purity of at least 99.95 per cent. can be produced without difficulty. The fact that metal as pure as this can be obtained from ore that often contains less than two per cent. of copper pays high tribute to the skill and ingenuity that have been exercised in the development of modern production methods.

The exceptional ductility and toughness of copper, which are of importance particularly from the manufacturing point of view, are effectively demonstrated by the ease with which it can be rolled into flat sheets less than one five-hundredth of an inch in thickness, or drawn into wire having a uniform thickness of only one-thousandth of an inch; a single pound of copper is sufficient for the production of over 60 miles of such wire.

Although copper in the annealed state is soft and easy to work, its strength and hardness can be increased when necessary very easily by cold working, that is to say by hammering, rolling or drawing the metal when cold. By this means alone the hardness and tensile strength of copper can be more than doubled. When a still harder or stronger metal is required, the properties of copper can be adjusted to suit almost any purpose by the addition of small proportions of other metals. If, for instance, it is desired that the electrical conductivity of the alloy shall not be lowered to any great extent, a small proportion of cadmium may be added. The addition of less than one per cent. of this metal considerably increases the tensile strength of copper but does not seriously affect its conductivity.

Stronger alloys still can be produced by the addition of small quantities of other metals. For instance, the addition of five per cent. of tin is sufficient to double the strength of copper, while the inclusion of a small percentage of beryllium makes it as hard and strong as high-grade steel. Alloys of this latter type are notable also for their exceptional resistance to fatigue with rapidly varying load stresses, and therefore are particularly suitable for the manufacture of springs and for other purposes in which this very valuable property is required.

As might be expected in view of its very high electrical conductivity, copper is also an excellent conductor of heat; it is for instance about six times as efficient as iron in this respect. Its (*Continued on page 122*)

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With the exception of those issued by the Scientific and Children's Book Clubs, which are available only to members, we can supply copies of these books to readers who cannot obtain them through the usual channels. Order from Book Dept., Meccano Limited, Binns Road, Liverpool 13, adding 6d. for postage.

"THE LONG TRAVERSE"
By JOHN BUCHAN
(Hodder and Stoughton. 7/6 net)

A boy's book by John Buchan is a great event, and in "*The Long Traverse*" the famous writer has given his readers something of the romance and excitement of the story of Canada. Young Donald is not at all good at school, particularly at such things as Latin and history, his own belief being that the really important world began with the invention of the internal combustion engine! He is a great sportsman, however, fishing being one of his special delights, and in this he is guided by the old Indian Negog, whose name means "Salmon-spear." Now Negog possesses the magic power of recalling the past in the surface of a clear pool with the setting sun on it, and with a fire of herbs at hand to prepare the mind of the watcher. This is the "Long Traverse."

Negog uses his magic on Donald for seven successive evenings, and among the wonders of his lake mirror the boy sees Cartier, the pioneer of French exploration and discovery in Canada: the Vikings who penetrated deep into America in the past distant ages; the fur traders in their canoes, and many other heroes of Canadian adventure in the Eastern Provinces, on the prairie, in the Rockies and in the Arctic. He sees the last stand of Cadieux, killed in ensuring the safety of fur traders pursued by hostile Indians; he shares in the terrors and triumphs of the warfare of the Piegans and Snakes, and looks on when the accidental discovery of a prehistoric bone snow knife saves the lives of men threatened with death in the frozen North. The visions of these thrilling events fire the boy's imagination and give him understanding of the spirit of the country.

The story is well illustrated and will be thoroughly enjoyed by every reader of the "*M.M.*"

"PREHISTORY"
By A. V. DE PRADENNE
(Scientific Book Club. Members only, 2/6)

Here is a book for the older reader who is interested to know what has so far been discovered of the prehistoric races of mankind. It is a well-written summary that will stimulate interest, and send its readers in search of more information on those who have given mankind the lordship of the earth.

The author begins by explaining how the remains of the past on which our knowledge is based have been preserved in such places as the beds and banks of rivers and the floors of caves. The implements, weapons and pottery of ancient man are described, so that the reader has a clear idea of the material on which prehistory is founded. The author then turns to the story of ancient man himself, giving readers a wealth of information on his dwellings, tools, and general activities, and telling the stories of the various discoveries of actual remains of these early human beings themselves.

Although the book is comparatively short, it is packed with sound and reliable material, and there are 51 drawings, most of them showing large assortments of tools and utensils, to illustrate the points that are made in the story.

Owing to wartime difficulties, it is impossible to guarantee prompt delivery of books ordered as described at the head of this page, but every effort will be made to ensure speedy despatch.

"THE SEASONS AND THE FISHERMAN"
By F. FRASER DARLING

"THE SEASONS AND THE WOODMAN"
By D. H. CHAPMAN
(Cambridge University Press. 6/- each)

In the first of these splendid books Dr. Fraser Darling writes of the exciting and often dangerous craft of the fisherman, starting with things that we all know and going on to explain many secrets of the harvest of the sea. This differs from the harvest of the farmer in that it cannot be increased, although ignorance may damage it, and so the fisherman must take what is there. Yet there is amazing wealth awaiting him. The author tells his readers where fish are to be found and how they feed, and gives accounts of the astonishing seasonal migrations of many of them. The main food fish are described, so that we can well understand the various ways of catching them that fishermen have worked out, and every form of fish life is dealt with, from the salmon, trout and small fish of the rivers to the tunny and other giants of the seas. How whales and seals are hunted is told, and finally we have the stories of the fishing ports and seasonal fisheries of the year.

Mr. Chapman's story of the woods is no less interesting. There is far more in the woodman's life than the recognition and cutting down of trees, for these must first be grown. Forestry is gardening on a giant scale, exercised with almost infinite patience, and the harvest is gathered only after many years. The woodman completes the planting of seedlings in the spring, and in the summer he thins out his plantations, wages war on weeds, insects and other pests, and keeps watch against fire. His autumn work consists in preparing for the year's planting, and he fells the timber in the winter, towards the close of which he sows his seed. Throughout he must do everything to give his charges every chance of growing unhindered into sturdy trees full of sound timber, and how he does it is here explained in a fascinating manner.

A particularly attractive feature of both books is provided by C. F. Tunnicliffe, who has contributed to each 50 splendid drawings of the most practical and realistic type.

"OKO THE BRAVE"
By D. HODGETTS and M. WRAY
(Lutterworth Press. 3/6 net)

Oko is a daring and inquisitive African boy, the leader of the boys of his village in games and escapades. He is driven from home because of his disbelief in evil spirits, and adventures then crowd upon him. He is snatched up by a crowd of rascally cattle drovers, but escapes from them with the aid of an enterprising missionary and joins a fine old fisherman, with whom he is instrumental in the capture of a gang of dangerous smugglers. Finally he returns home, complete with a bicycle that is the envy of his friends, and there he helps to break for ever the power of the priests.

This is an excellent story for younger readers. It contains a frontispiece and 10 other full page illustrations.

Air News

Air Training Corps Completes its First Year

The Air Training Corps recently completed its first year. In that short time it has grown into one of the largest youth organisations in the world. Even before the end of 1941 there were well over 1,000 local units and nearly 400 school units, with a total strength of about 160,000. Already several thousand A.T.C. cadets have passed into the R.A.F., and several thousands more are now on "deferred service," waiting their turn to join. As the maximum age for membership of the A.T.C. is 18, the full extent of the flow to the R.A.F. was not developed at once, but the results are already most promising, and the full effect will be seen this year.

The early success of the Corps has already had an effect on the training programme of the R.A.F. As more and more entrants to that Service come in already armed with their A.T.C. proficiency certificate, it will enable R.A.F. training capacity to be saved, and a higher standard set in the early stages of flying and technical training.

Freight-Carrying Gliders

Probably the time will come when transport aircraft will both carry big loads of freight and at the same time tow heavily laden gliders behind them. A step in this direction has been taken in the United States where an aeroplane designed to carry five to six tons of freight and tow up to five laden gliders at a time is under construction. Each glider will carry about four tons of freight, and when in flight will be uncoupled from the aerial "train" as this nears the glider's destination.

Canadian "Anson"

A Canadian version of the well-known Avro "Anson" reconnaissance machine is being produced by Federal Aircraft Ltd., for use as a twin-engined trainer in the Empire Training Scheme. It is fitted with two Jacobs 330 h.p. engines instead of the Armstrong Siddeley "Cheetahs" used for the British "Anson," and considerable use of plastic materials is made in its construction.

Air Crews Help to Build Bombers

Courses designed to show airmen British giant four-engined bombers in every stage of construction are now being carried out at a large factory somewhere in England. The courses last about a fortnight and have been organised by the R.A.F. Technical Training Command. The airmen, who are drawn from operational stations or units in many parts of the country, are housed in the factory's Home Guard barracks, and dine on the premises.

Instruction is given by means of illustrated lectures on the various components, wiring, petrol, oil and air systems, and by practical tuition in the shops, beginning from the smallest parts and working through the production line stage by stage, until the aeroplane is loaded ready for despatch to the aerodrome for final assembly. Special attention is paid to the retractable undercarriage, which is tested on a specially built jig. The adjustments are thus much more easily understood than they would be if they had to be explained on a completely built aeroplane.

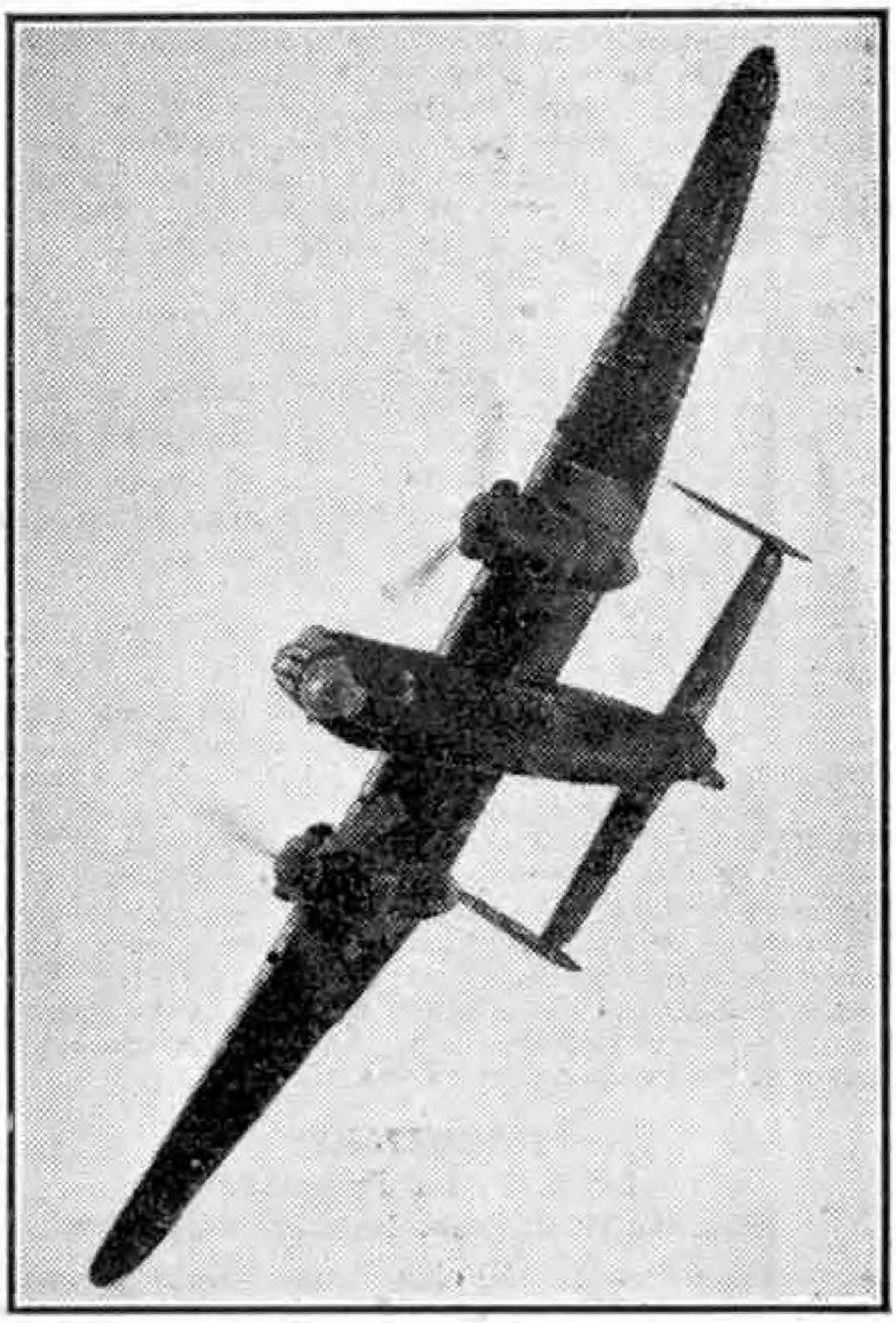
After passing through the aero-assembly shops the airmen see the finished machines being put through their paces on the company's aerodrome by test pilots. A "ride" in one of the bombers is a fitting end to the course.

* * * *

In Germany glider training is now compulsory for students, of both sexes, of the Physical Culture Faculties of the Universities. Tuition is given at special camps established in many parts of the country.

Portable Runways

Portable steel runways used during military manœuvres in the United States have proved a great success, as even the largest and fastest machines have taken off from and landed on them without difficulty. Each runway is 3,000 ft. long and 150 ft. wide, and consists of a series of corrugated steel gratings 10 ft. long, 1 ft. 4 in. wide, and $\frac{1}{8}$ in. thick, locked together to make up the required size. The assembled runway weighs about 1,000 tons. The experimental use of these novel runways is being carried out by the United States Corps of Engineers.



The Avro "Manchester," the largest twin-engined bomber in the world. "Manchesters" have taken part in many big raids on targets in Germany, Italy, and enemy-occupied territory. Photograph by courtesy of "Flight."

Empire Air Training in Canada Extended

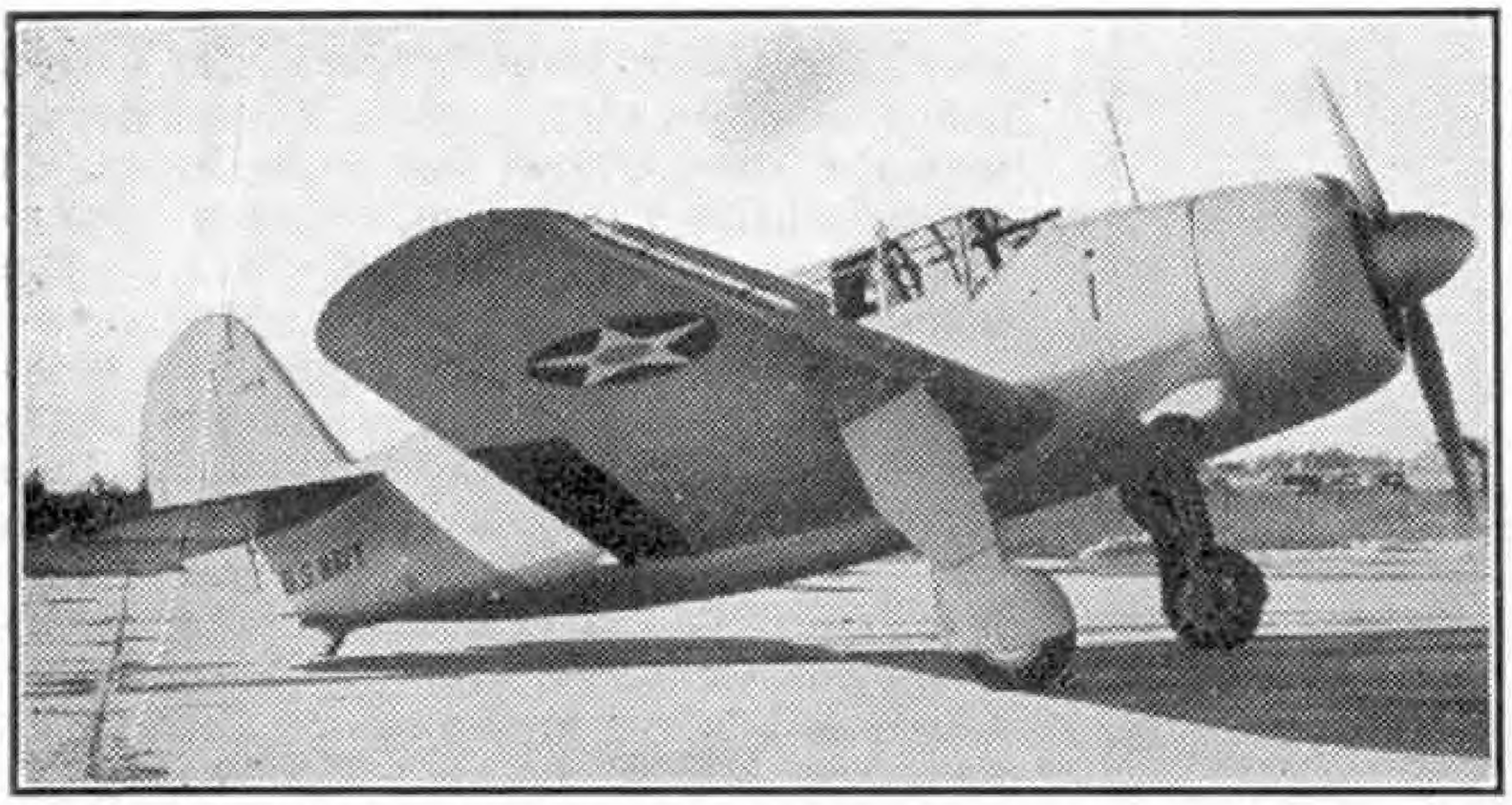
The Empire Air Training Scheme in Canada has made wonderful progress, and is so far ahead of schedule that the period of training is to be extended. Instruction at the initial Training Schools and Elementary Training Schools and at the Service Flying Training Schools will also last longer. More time also will be devoted to tuition in navigation and aircraft recognition, and to physical training.

* * * *

E. D. Shannon, a test pilot of the Glenn Martin company at Baltimore, U.S.A., was reported recently to have dived a bomber at a speed of 560 m.p.h. during a test flight. This is claimed as a record dive for a bomber.

"Bristol" Twin Gun Turrets

One of the most familiar features of the modern bomber is the gun turret, or turrets, from which the crew ward off attacking aircraft, and in some cases carry out machine gun attacks upon enemy objectives on the ground. The "Bristol" power-operated turret



The Curtiss SB2C-1, a fine dive-bomber in service with the United States Navy. Photograph by courtesy of Curtiss-Wright Corporation, U.S.A.

designed by engineers of the Bristol Aeroplane Co. Ltd. was the first to be produced in large numbers for the Royal Air Force. It gave the R.A.F. an added factor of supremacy in the air, which was of enormous importance and of which they were quick to take advantage. Many times have small numbers of "Bristol" Blenheim bombers driven off larger forces of attacking aircraft possessing higher speed, heavier armament and greater manœuvrability than the British machines. The ease and accuracy of operation, and the steadiness of fire from the British hydraulically-operated gun turrets, undoubtedly have contributed to the deadliness of the R.A.F. gunners' aim.

The lower photograph on this page shows the "Bristol" twin gun turret that is fitted in the Blenheim Mk IV bomber. The hydraulic system operates at a very high pressure, up to 1,200 lb. per sq. in., which is obtained by a special three-stage "Bristol" pump. This pump raises, retracts, and rotates the gun without effort on the part of the gunner, all the movements being synchronised automatically. The guns fitted in the early "Bristol" turrets were of the Lewis type, .303 bore. Later the Vickers gas-operated gun was employed, and now twin Browning guns are fitted.

"Bristol" gun turrets are about half the weight of other power-driven turrets, and smaller in size, and the guns are exceptionally accessible for clearance in case of jams. The "Bristol" turret was the first to be fitted amidships in the fuselage of the modern all-metal, stressed-skin monoplane, and it has an effective "restrictor" gear that enables the gunner to rotate the turret smoothly at full speed without fear of damaging his guns or the aircraft fuselage.

A "Clipper's" 24,686-miles Homeward Flight

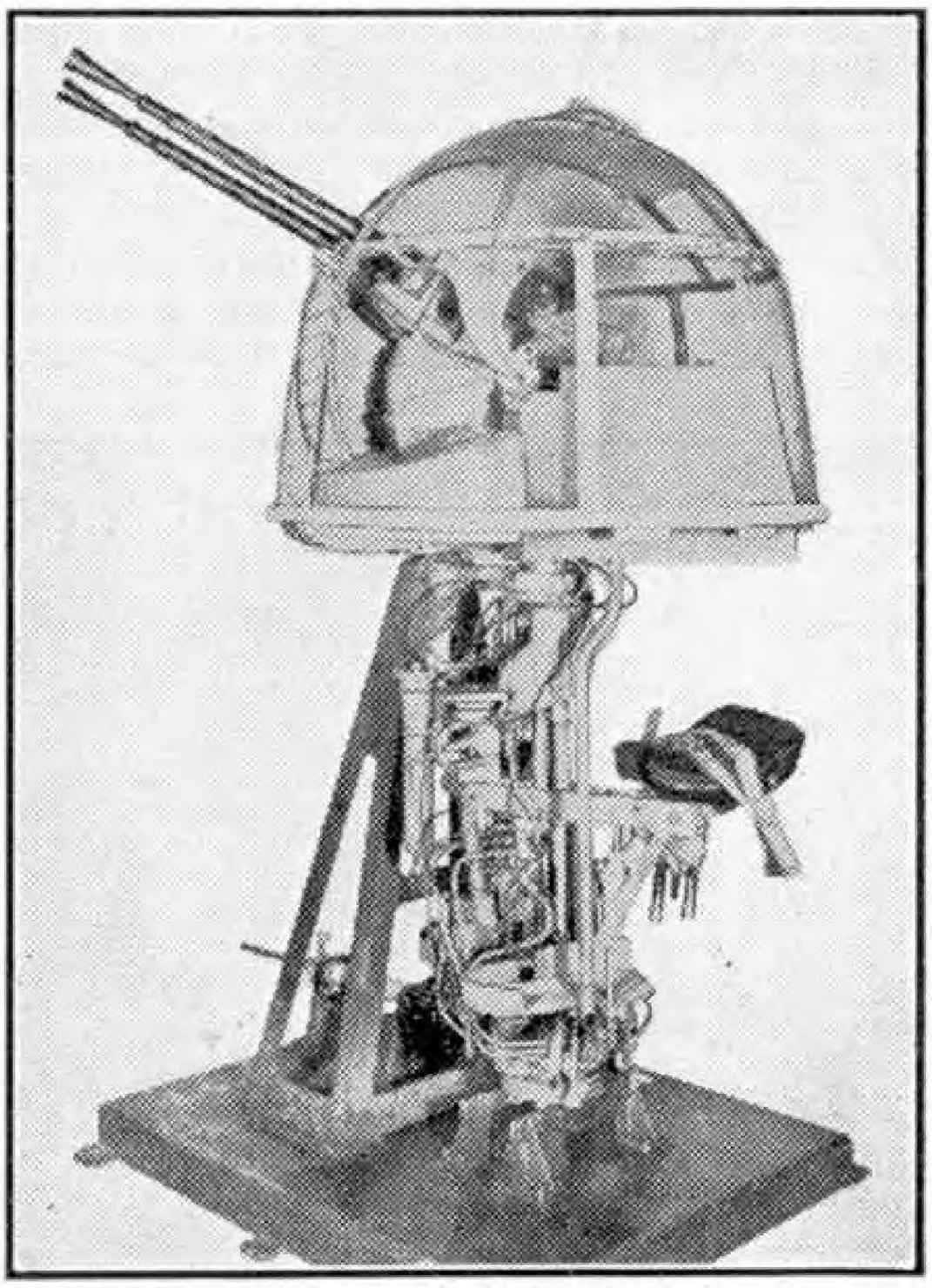
When war broke out in the Pacific last December the Pan American Airways flying boat "*Pacific Clipper*" was nearing Auckland, New Zealand, on its outward trip from San Francisco. The pilot, Capt. Ford, was ordered to make the return flight by an emergency route already planned, and he landed at New York on 6th January last, after a 24,686-miles flight that took 22 days.

This remarkable homeward trip began on 16th December when the "*Pacific Clipper*" took off from Auckland with 18 passengers on board for Australia, and flying by way of Noumea, in New Caledonia, made the first direct air crossing between there and the Australian mainland. The passengers were landed, and with only a crew of 18 aboard the boat flew across the Timor Sea and the Netherlands East Indies, avoiding Singapore and heading for a port in the Indian Ocean. No lights were shown and no radio communication made, lest they betray the boat. Flying by way of the Gulf of Aden the boat arrived at an East African port, and after a 3,000-miles overland flight across Central Africa took off from a port on the west coast for the 3,583-mile crossing of the South Atlantic to Brazil. This was the longest non-stop lap of the journey home. The last 5,000 miles, from Brazil to New York, was made with one intermediate stop.

This flight back to the United States was over a route lacking the benefits of radio beams and weather reports, and with no radio communication other than a few messages that the crew intercepted. Ample food supplies were carried in case a forced landing had to be made in some remote spot, and a spare engine provided the engineers and mechanics with essential parts when overhauling the "Clipper's" engines.

* * * *

The Russian "Stormovik" dive-bomber used extensively by the Soviet Air Force has been an outstanding success, especially in attacking tanks and enemy aircraft on the ground. It is a fast, single-engined low wing monoplane, heavily armed, and armoured, and has a 12-cylinder liquid-cooled Vee type engine.



"Bristol" hydraulically-operated, retractable, twin gun turret as fitted in "Bristol" Blenheim Mk IV bombers. Photograph by courtesy of Bristol Aeroplane Co. Ltd.

"Peter Pan Calling." A fine cloud effect is turned to good use in this charming picture by A. G. Dell, West Norwood, London, S.E.27.

Photography

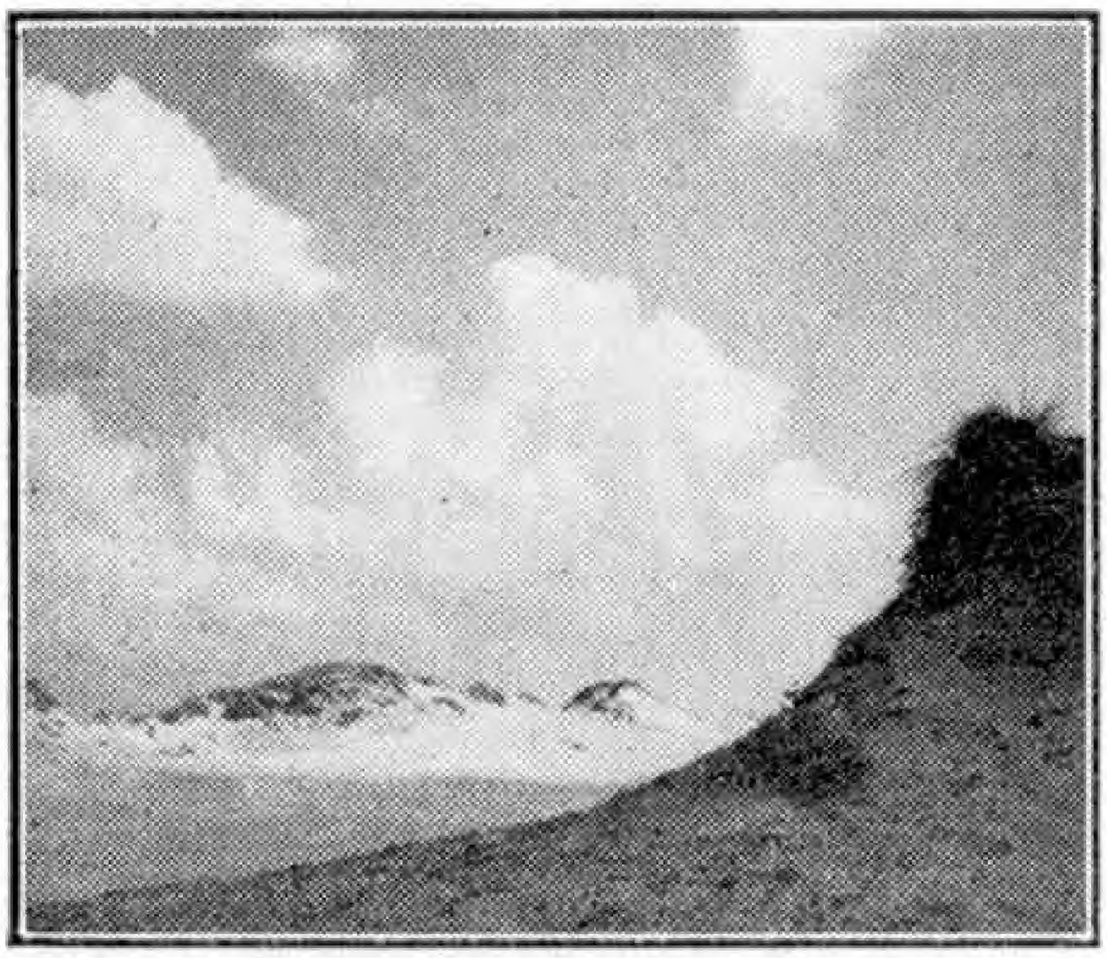
March Days and Clouds

MARCH days bring greatly increased opportunities for outdoor photography, and from now on there will be an abundance of interesting subjects awaiting the camera enthusiast.

One of the chief glories of March and early spring is the wonderful sky and cloud effects that are seen at their best during this period. Great masses of billowy white clouds chase one another in ever-changing patterns across skies of brilliant blue, and it is surprising that so few photographers pay serious attention to these beautiful subjects. This probably is due to a great extent to the widespread idea that clouds are difficult to photograph. This certainly was the case before the introduction of colour-sensitive plates, but to-day, excellent results can be obtained even by the beginner with his simple camera.

In order to secure good skies in a landscape picture, with the white clouds standing out against the grey background that represents blue sky, a panchromatic film must be used, together with a yellow light filter over the camera lens. A film that is not colour-sensitive records the blue sky nearly as brightly as the clouds, so that the necessary contrast is lost. A panchromatic film, on the other hand, makes use of the coloured components of the light from the clouds in such a manner as to render the clouds more brightly. At the same time the yellow filter subdues the light from the sky, and the combined result is to give the necessary contrast between sky and clouds.

"Dawn." From a photogaph by R. E. Hogben, River-in-Dover.



"Clouds and Dunes." A very ordinary scene transformed by a good cloud effect. This picture is the work of F. Schorrewegan, Lierre, Belgium.

It often happens, with the usual perverseness of things, that at the moment when we photograph a particular scene clouds are either absent or form an unsatisfactory combination. In such a case the picture often can be greatly improved by adding to it an attractive sky from a separate negative by a process of double printing such as that described in the "*Meccano Magazine*" for March 1941. It is therefore well worth while to make a small collection of pictures of clouds and sky alone, from which a suitable one can be selected to fit the picture we wish to improve. The cloud negative must be chosen carefully to ensure that it suits the picture and looks natural.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

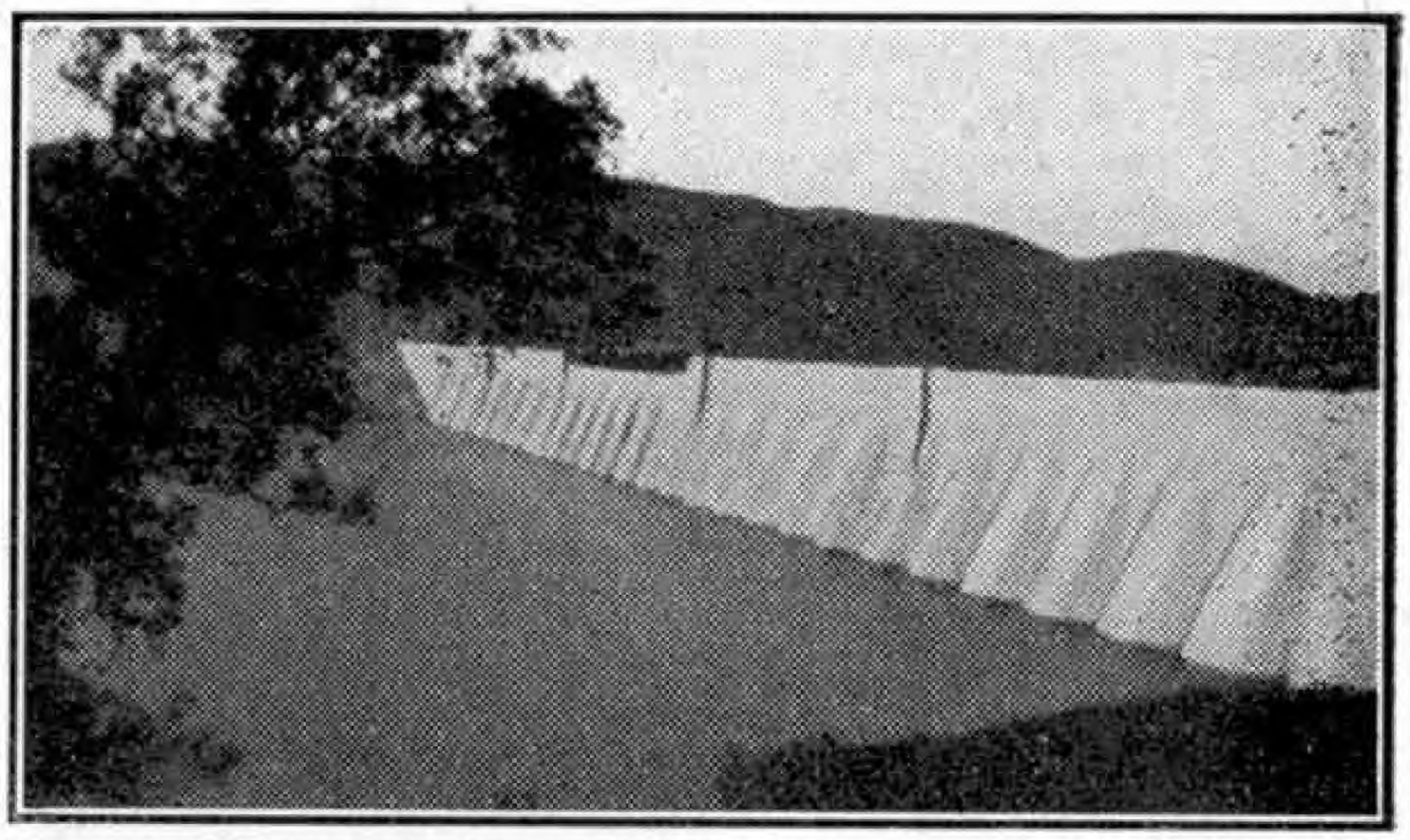
A VISIT TO HAWESWATER DAM

Some years ago, while spending a holiday in the Lake District, I visited Haweswater and drove alongside the lake to the tiny hamlet of Mardale, with its quaint centuries-old church. Recently I again visited the lake to find that during the intervening years a great development had taken place. Stretching across the lake was the stately dam, the building of which was described in the August 1938 "*M.M.*" and where the village of Mardale used to be stretched acres of rippling water.

The grey stone of which the dam is built and the buttress effect of the face combine to make it blend into the surrounding scenery. From the new road, which runs alongside the lake, the banks slope down to the water, steeply in parts, and on each side of the lake, spaced at even intervals, can be seen white stones that mark the height to which the water can rise before the pressure on the dam becomes too great.

In the background are the huts in which the workers were housed while the dam was being built. They formed a village which had its own cinema and recreations. These huts are only temporary and are to be removed. Life in such a village would be anything but nice in the winter, when the cold wind whistled through the valley and snow lay deep on the ground.

An aerial ropeway, to supply materials to the workers, stretched from the new road on the eastern side of the lake over the dam to the western side.



The face of Haweswater Dam. Photograph by C. A. Brockbank, Southport.

This ropeway has now been removed, but its steel platforms still loom menacingly over the lake.

It was hard to leave this peaceful spot, but I took a last look at this magnificent structure, surrounded by rugged heather-coated hills, and went on my way to Kendal. C. A. Brockbank (Southport).

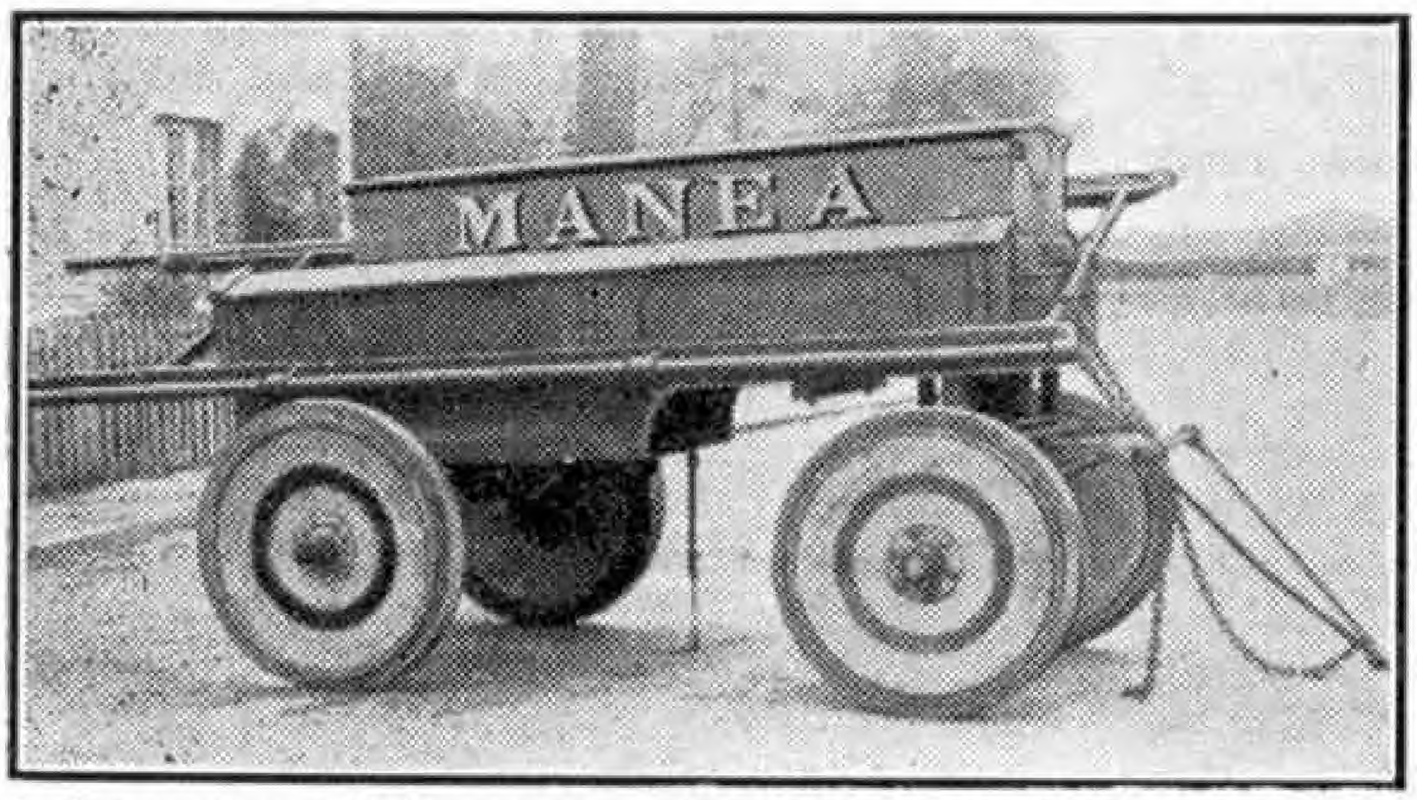
FIRE ENGINE NEARLY 100 YEARS OLD

When on a visit to Manea, Cambridgeshire, the village fire engine attracted my attention. This is a manual engine, and on the back is the date 1846, so that it is 96 years old. It is likely that this is the oldest fire engine still at work in the country.

The engine needs 20 men to work it, 10 at each of the long horizontal handles, one on each side of the engine. Pumping with it is very hard work, and the team of 20 men is exhausted in about a quarter of an hour. Then they must be relieved by another 20 helpers, after which the first team goes back to work again. This continues until the fire is extinguished.

Although this engine is so old and is worked by man power, it has done exceptionally fine work and is still in first-class working order. Formerly it was horse drawn, but by means of a new attachment it can now be towed behind a car or lorry and so can reach the scene of a fire quickly.

J. W. Morton (March).



A fire engine still in service, although it is nearly 100 years old. Photograph by J. W. Morton, March.

KING CHARLES' STATUE

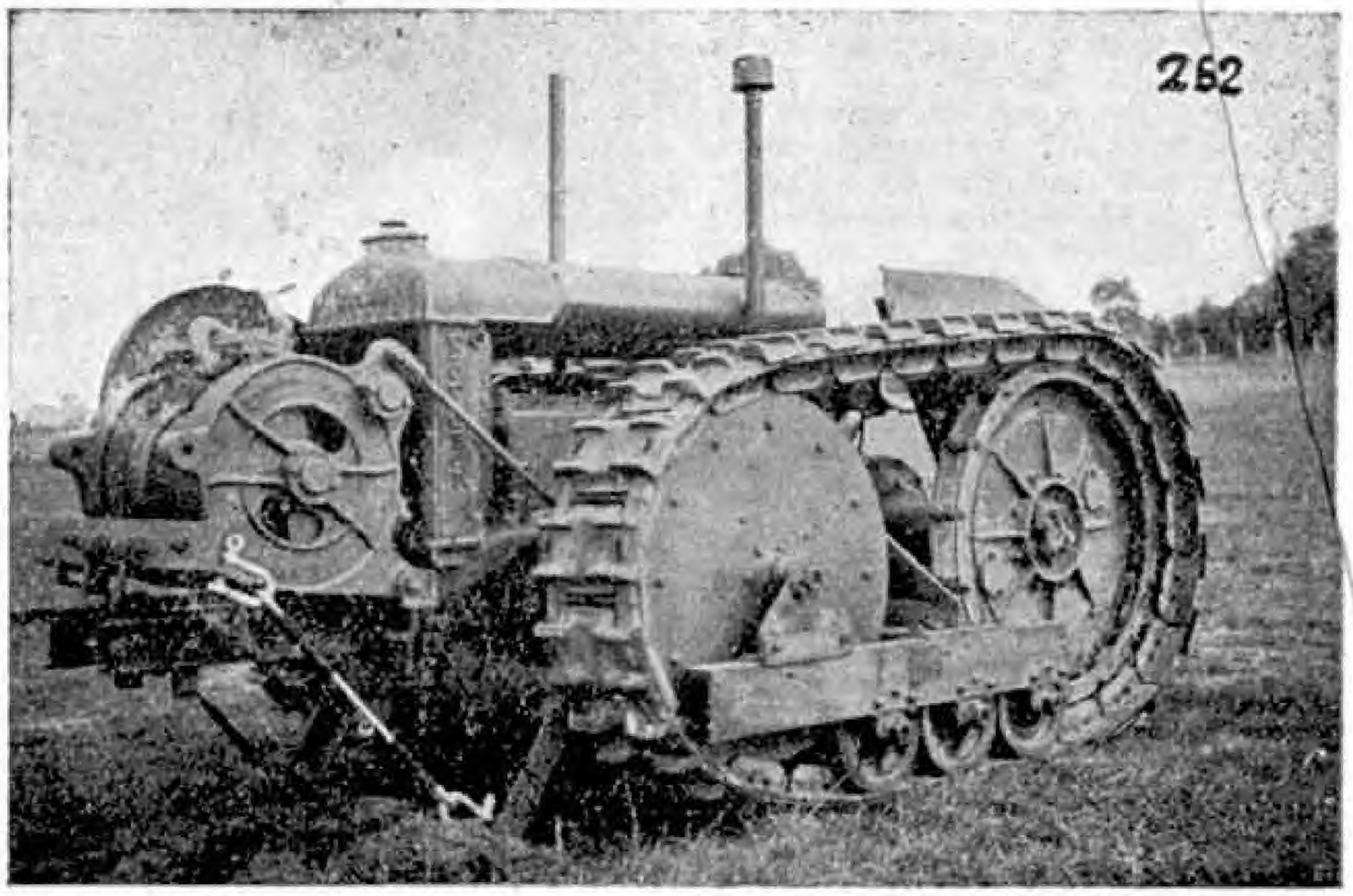
The statue of King Charles I, which has been moved from Whitehall to a safe place in the country, has known some stirring times, and has survived the upheavals of three centuries. During the Civil War in the 17th century it was put in the crypt of St. Paul's Church, in Covent Garden, and there it stayed for several years after the Protectorate was established. Then it was taken away and sold to a John Rivett for old metal.

Now Rivett was supposed to break the statue up, but he did not carry out his orders. He pretended he had melted down the statue, and sold spoons, candlesticks and other articles in great numbers at high prices to sentimental Royalists, assuring them that these objects were made from the bronze it yielded. A. Lord (Birmingham 27).

Engineering News

A Useful Tractor and Winch

A tractor fitted with a winch is a very useful implement for many hauling jobs on farms and in construction work, and a machine of this kind is shown in the illustration on this page. It is a Fordson Roadless tractor, and has a chassis extended at the front to carry a winch manufactured by Chas. M. Hesford and Co. Ltd., Ormskirk, which is capable of a pull of from 12,000 to 15,000 lb. Also fitted under the front end of the chassis is a pivoted sprag that normally tucks up clear of the ground. When the winch is in operation, however, the sprag is lowered and then digs into the ground to hold the machine stationary against the pull of the winding rope. In reasonably firm ground the sprag will hold the tractor against the full power of the winch, and in order to release it after use it is only necessary to reverse the tractor a few feet. The winch drum normally carries 300 ft. of $\frac{5}{8}$ in. diameter steel wire rope, but a greater length of rope of smaller diameter can be fitted if desired.



A tractor fitted with a Hesford winch, as described on this page. Photograph by courtesy of Roadless Traction Ltd., Hounslow.

New British Ships from America and Canada

The first merchant ship built in the United States for Great Britain arrived at a British port recently. This is *"Ocean Vanguard"* a vessel of 7,000 tons gross and 10,100 tons dead-weight carrying capacity. She is the first of a great fleet of merchant ships now under construction in the States for service under the British Government, and was built at the Todd Shipbuilding Yard, Richmond, California. When her keel was laid the yard was little more than a mud flat and construction work on it was carried out simultaneously with the construction of the ship.

An equally interesting and important arrival was the *"Fort Ville Marie,"* the first Canadian-built ship for Britain, which also is of 7,000 tons gross and carried a cargo of wheat, apples and high explosives. This vessel was scheduled to be completed in May, but work on her was speeded up. She was built in Montreal, and other similar vessels are being constructed there and in Quebec.

Dredger Moved Across Land

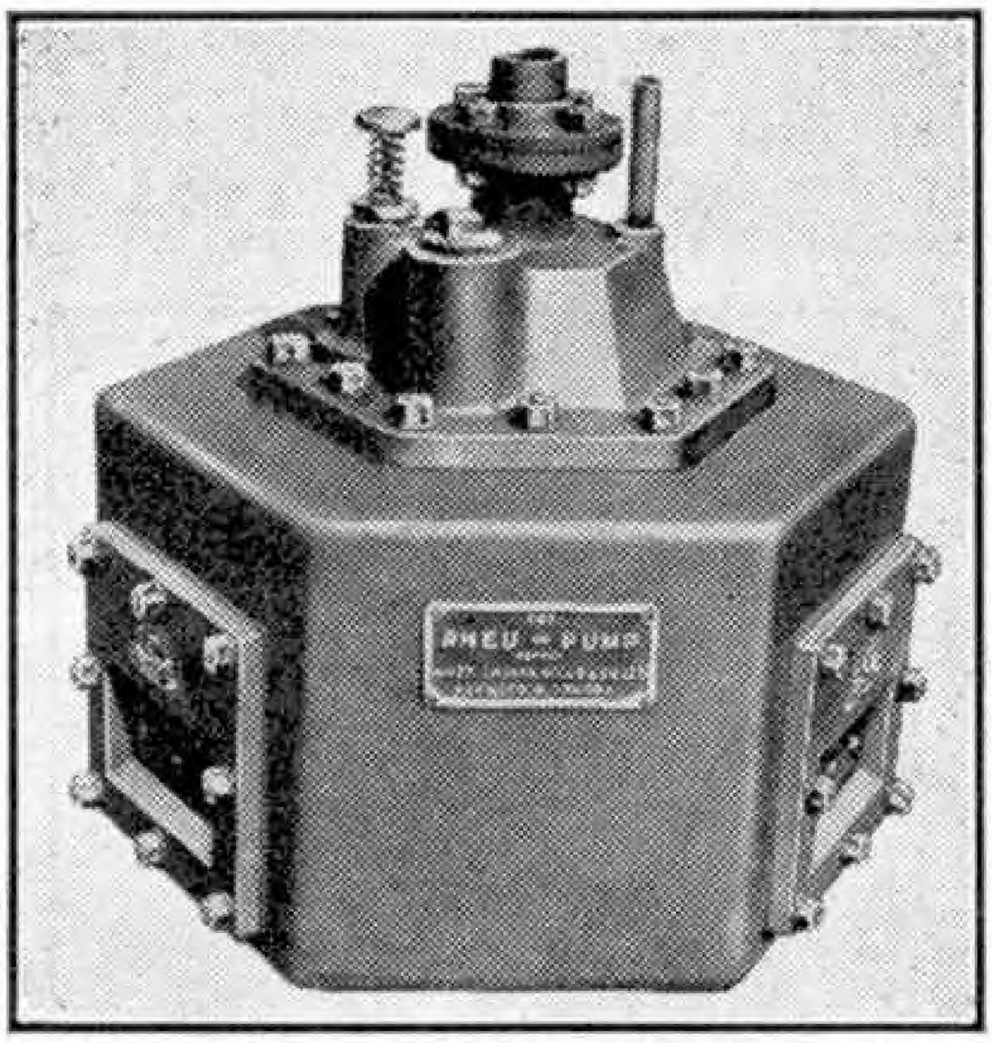
American engineers are experts at lifting large buildings and other structures and transporting them bodily from one site to another. One of their most recent exploits in this direction concerned a large dredger, which they shifted across land from one site in the Panama Canal zone to another site nearly half a mile away. The dredger measured 100 ft. by 35 ft., and weighed 220 tons. It was picked up by a floating crane and placed on a timber skidway, along which it was slowly hauled overland by a powerful tractor and pulley tackle. To accomplish the journey it was necessary to cross a highway and three railway tracks.

New Swedish Ships

Several new ships have been launched from Swedish shipyards recently. One of these is the cargo motorship *"Barranduna"* of 8700 tons and designed for a speed of 16½ knots. Another is the 278 ft. cargo steamer *"A.Th. Jonasson,"* which has propelling machinery of 1500 I.H.P., that gives her a speed of 12 knots. A third vessel is the motor tanker *"Tankland."*

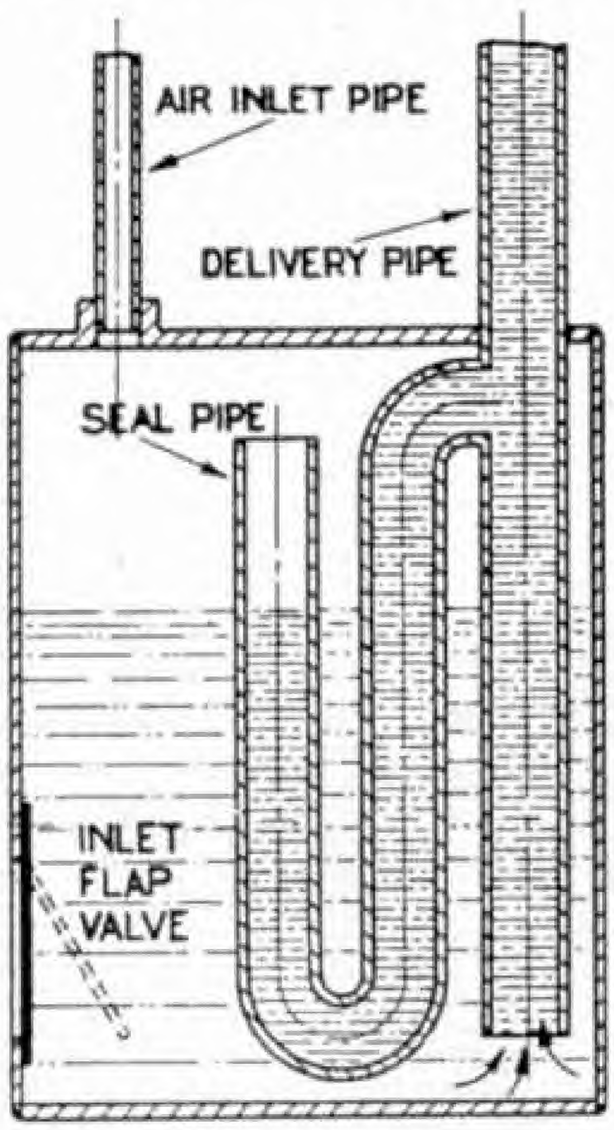
A Novel Compressed Air Pump

At intervals there appears an invention that makes use of long-established principles in a manner so original as to justify the daring claim that it is new. A recent invention for which patent rights are claimed by Ames Crosta Mills and Co. Ltd., sewage plant makers of Heywood, Lancashire, is an example. This consists of a pump, which is so simple that it contains no moving parts except an inlet flap valve. An exterior view of the device, which is known as the "Pneu-Pump," is shown in the upper illustration on this page, and its method of operation is illustrated in the accompanying diagram.



The Pneu-Pump. This photograph and the diagrammatic drawing below are reproduced by courtesy of Ames Crosta Mills and Co. Ltd., Heywood.

The pump is actuated by compressed air, and the principle of its application is particularly ingenious. The body of the pump is an enclosed cast-iron or welded steel vessel of hexagonal or other suitable shape, towards the bottom of which is a flap valve or valves through which the liquid to be pumped enters. A pipe conveys compressed air to the vessel, and a second vertical pipe carries the liquid away under the action of the compressed air. Inside the vessel, and coupled to the discharge pipe, is a special seal pipe, which controls the cycle of operations within the vessel. When the seal pipe is open, the compressed air entering the vessel escapes direct to atmosphere giving practically no atmospheric pressure inside the vessel. When in action the pump is submerged in a sump or well. Water flows in through the inlet valve and passes into the body. As the vessel fills, the water covers the seal pipe, thus forming a trap that prevents the escape of air. Air is still entering the vessel, however, and it forces water through the delivery pipe. The water level in the seal pipe falls along with that in the main vessel, until a bubble of air can escape round the U bend of the seal pipe. Immediately this occurs the column of water in the delivery pipe is lightened, and the air escapes quickly, driving before it all the water in the pipe. In this manner the vessel is again opened to the atmosphere, and the cycle is repeated. So long as air and water are available the pump functions entirely automatically.



A drawing showing the operational principle of the Pneu-Pump.

A simple float-operated valve can be fitted to the air supply and this is particularly useful in instances where the pump is used for draining sumps. As the water level rises in the sump, so the air is turned on and the sump is kept at its lowest level.

In the larger pumps an air economy valve is fitted in the air pipe to prevent any appreciable wastage of compressed air during the stage when water is flowing into the pump body.

Many applications suggest themselves for so versatile a pumping device, such as clearing drainage sumps in cellars, lifting from wells to overhead tanks, and lifting liquids in connection with sewage purification plants. The pump can often be used for clearing seepage in excavation works, where there is usually an air supply available from a portable compressor used in connection with pneumatic tools.

New Method of Sealing Collapsible Tubes

Collapsible tubes can now be sealed by a new method which consists of welding the ends of the tubes instead of folding them as is usually done. This process renders the tube air-tight and liquid-tight and uses less metal.

Suggestions Section

By "Spanner"

(540) A Simple Bell Mechanism

("Spanner")

A novel bell mechanism that incorporates a very simple striking device is shown in Fig. 540. Its essential feature is a $\frac{1}{2}$" × $\frac{1}{2}$" Angle Bracket 1 that engages the teeth of a $1\frac{1}{2}$" diam. Sprocket Wheel 2. This Sprocket Wheel may be rotated either by hand or by a Clockwork or Electric Motor. If the Clockwork Motor is incorporated its brake lever should be connected to a suitable switch, and if an Electric Motor is used a switch of the push-button type should be included in the circuit connecting the Motor to the current supply.

The Angle Bracket 1 is bolted to one arm of a pivoted Boss Bell Crank and is held in engagement with the teeth of the Sprocket 2 by a Spring 3, which is bolted to it and also to a fixed base in the position shown. The hammer, consisting of a Threaded Boss bolted to a Cranked Curved Strip, is fixed to the remaining arm of the Boss Bell Crank. The gong is a Boiler End fixed to the base by means of a $1\frac{1}{8}$" Bolt. This produces a high-pitched note when struck by the hammer.

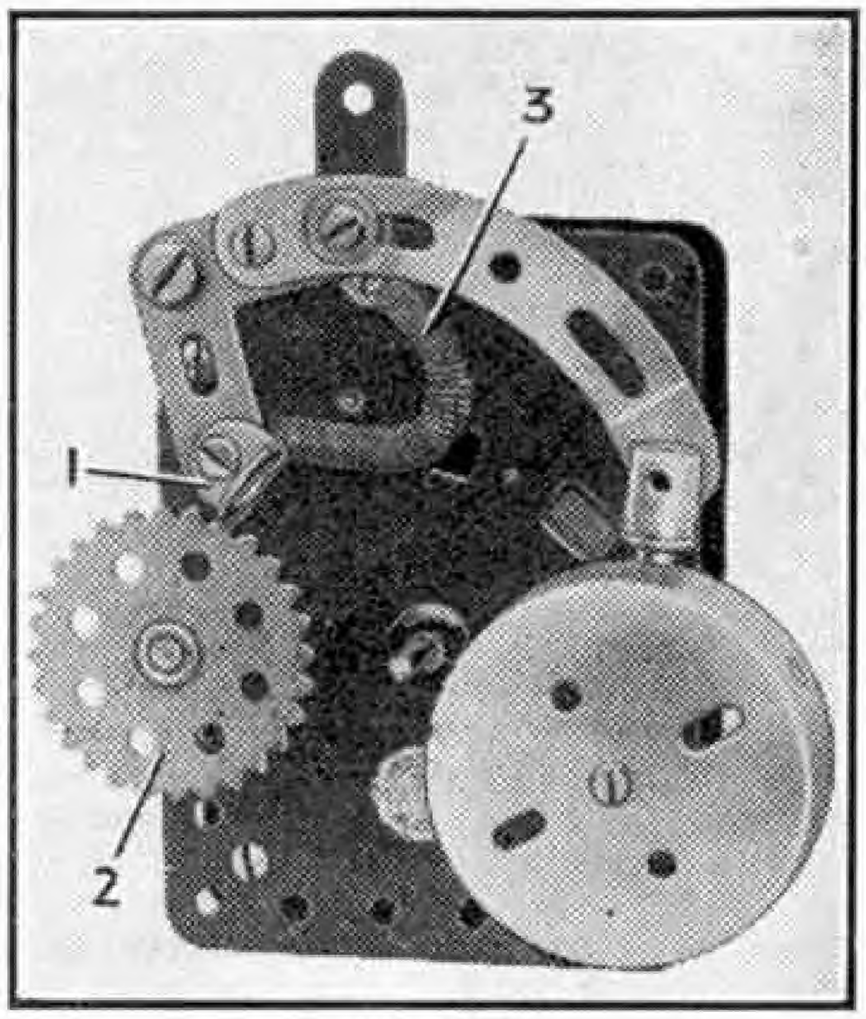


Fig. 540.

(541) Epicyclic Transmission Gear

("Spanner")

The device shown in Fig. 541 is designed to provide a drive transmission ratio of 2:1 between any two shafts. Its chief merits lie in its compactness and in the fact that the driving and driven shafts are mounted in line with one another.

The handle 1 is secured to a 2" Rod that revolves in a Double Bent Strip forming part of the bearings 2. This Rod is free to rotate in the boss of a $1\frac{1}{2}$" Contrate Wheel 3, but is fixed in one end of the Coupling 4. A second Rod 5, which runs freely in the opposite end of the Coupling 4 and is journalled in reinforced bearings 6, carries a $1\frac{1}{2}$" Contrate Wheel 7, which is fixed in the position shown.

A $1\frac{1}{2}$" Rod 8 gripped in the central transverse hole of the Coupling is fitted with a $\frac{3}{4}$" Pinion 9 that is free to rotate about the Rod, but is retained in position by a Collar 10. The Pinion meshes with the teeth of both Contrate Wheels 3 and 7.

The Double Bent Strip 2 is bolted to the Plate by two $\frac{1}{2}$" Bolts, the shanks of which pass into the holes in the Contrate Wheel 3 and so prevent the latter from rotating.

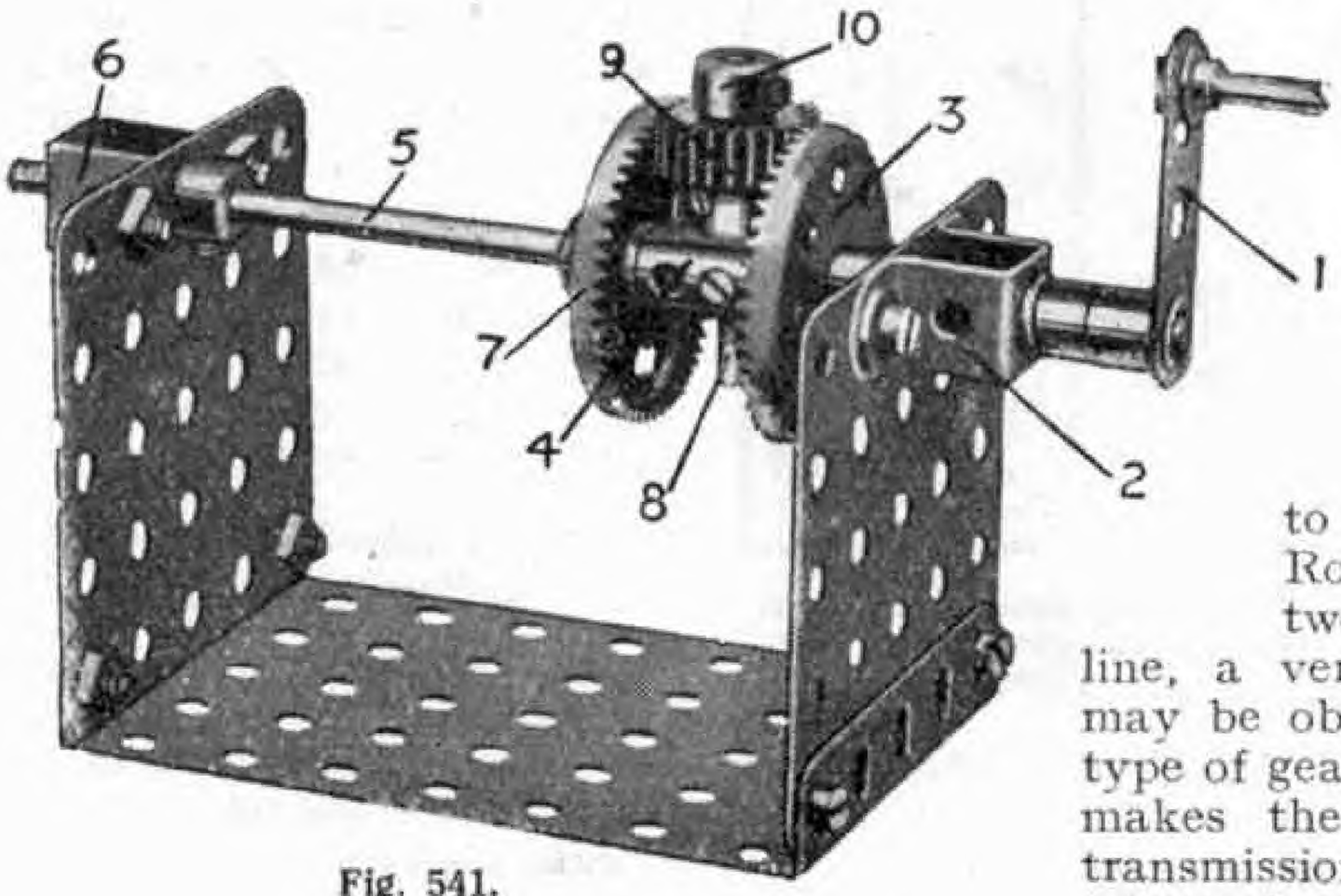


Fig. 541.

When the gear is in operation the secondary shaft 5 rotates twice as fast as the driving Rod carrying the handle 1. Alternatively, by applying the drive to Rod 5 a 2:1 reduction gear will be obtained, for then the 2" Rod will revolve once only to every two revolutions of the Rod 5. By repeating the device two or three times in a straight line, a very compact transmission gear may be obtained. In actual practice this type of gearing is used when lack of space makes the more usual forms of drive transmission, such as spur gearing, impractical.

(542) Steering Gear for Tractors

(H. F. Gibbs, Liverpool 19)

Fig. 542 shows a special form of steering mechanism that is designed for incorporation in model military tanks and creeper tractors. These machines are steered by retarding one or other of the creeper tracks. If a left turn is to be made the left-hand track is retarded, while the right-hand track is braked when a right-hand turn is desired.

In the mechanism illustrated the driving shaft carries two $\frac{1}{2}'' \times \frac{1}{2}''$ Pinions 1 that normally mesh with 57-teeth Gears 2 mounted on stub axles that carry the driving sprockets for the creeper track.

The Gears 2 are loose on the Rods, but they rotate Bush Wheels 3 that are fixed to the axles, and carry Threaded Pins that engage holes in the Gears. A Compression Spring is placed on each Rod so that the Gears mesh with the Pinions 1.

Either of the Gears can be thrown out of mesh by moving the selector, which consists of a $2\frac{1}{2}''$ Strip, to the left or right. This Strip is pivoted at its centre hole, and is attached at its lower end to a Double Bracket that is held between two Collars on a Rod carrying at each end a Crank 5. The outer ends of the Cranks are placed on the axles so that they engage the bosses of the Gears 2.

By adjusting the position of each Bush Wheel 3 on its stub axle the Threaded Pins engaging the Gears 2 also engage the Crank of that Gear, thus forming a locking device for the stub axle. In cases where it is not desirable to use the device described a brake should be arranged for each stub axle that can be applied automatically immediately the axle is thrown out of engagement.

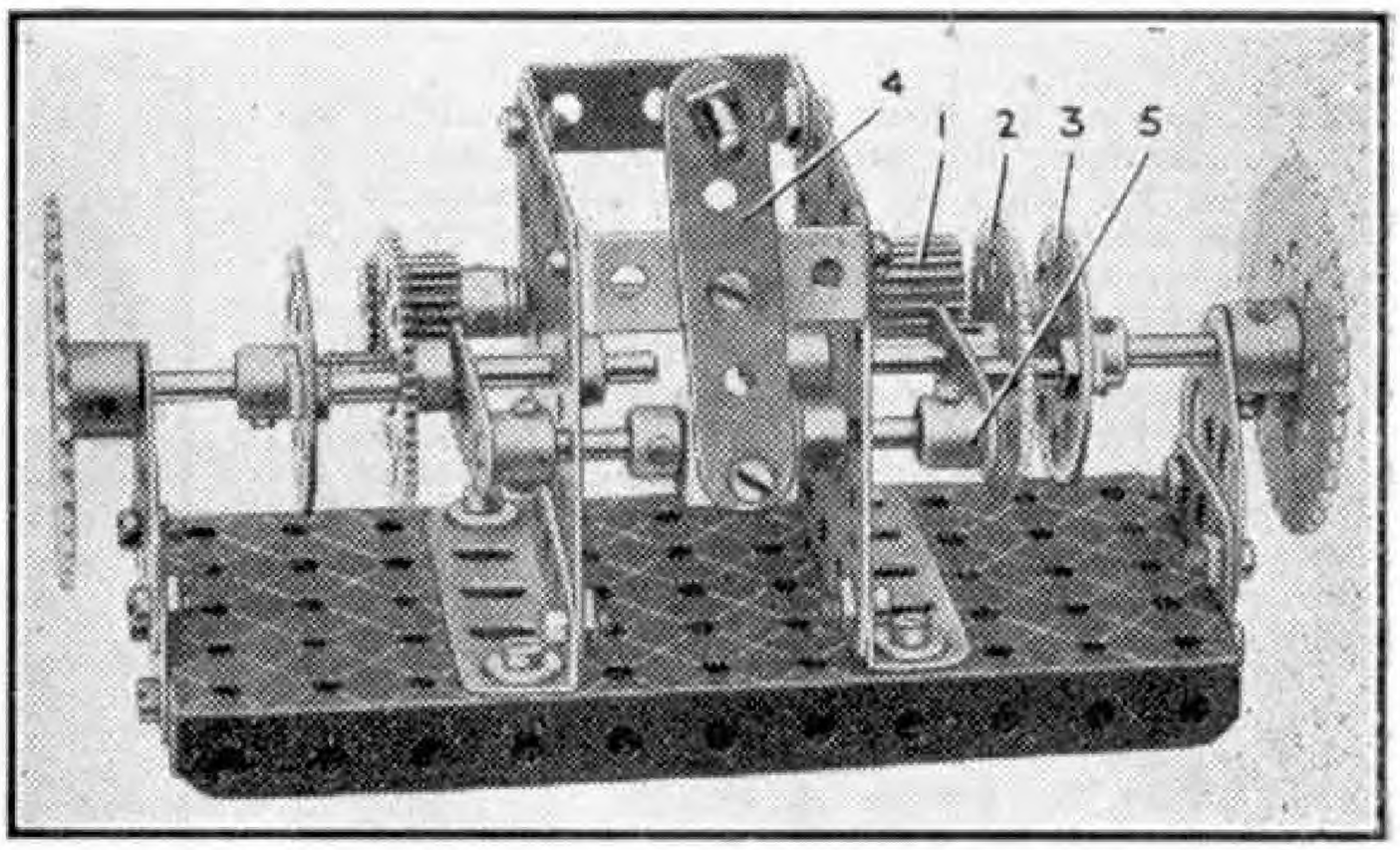


Fig. 542.

(543) Constant Engagement Intermittent Motion

("Spanner")

In most mechanisms designed to convert continuous rotary motion into an intermittent rotary motion, some part of the mechanism is periodically out of engagement. Unless a suitable locking mechanism is incorporated this means that the disengaged section of the movement is practically out of control for a short period, and therefore is liable to error. The mechanism shown in Fig. 543 avoids this difficulty and transmits timed impulses to a shaft accurately and without the least danger of slip.

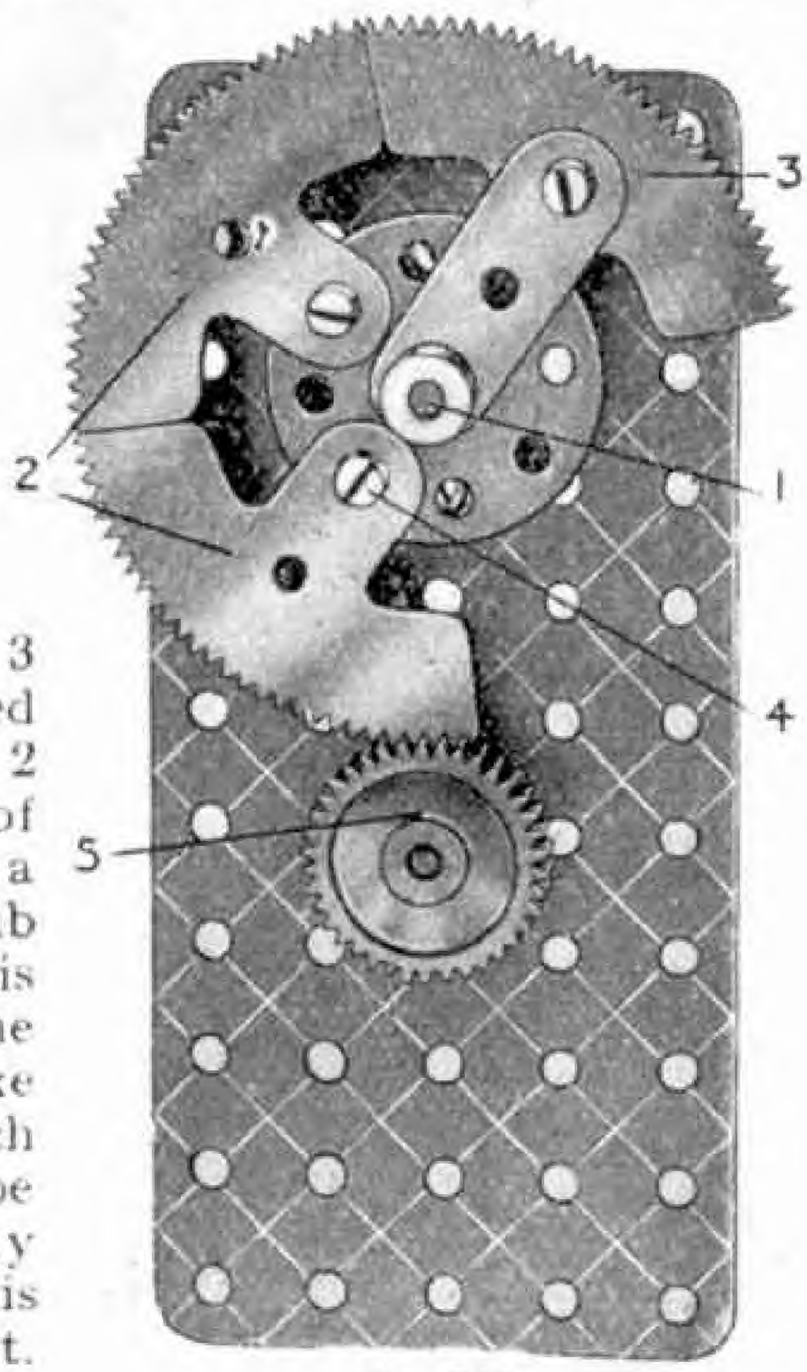


Fig. 543.

In the model the base consists of a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plate fitted on the reverse side with two bearings formed from Double Bent Strips. The lower bearing carries a short Rod coupled to a shaft and fitted with a 1" Gear Wheel 5. This Gear engages with a half-section of a 3" gear built up from a Bush Wheel 4 and two Rack Segments 2. The Bush Wheel is locked on a Rod 1 that transmits the intermittent drive to the desired point of a model. A third Rack Segment 3, bolted to a $1\frac{1}{2}''$ Strip is free to swing about the Rod 1, a Collar being used to hold it in position.

One end of a length of Spring Cord is now secured to the Bolt that connects the Rack Segment 3 to its $1\frac{1}{2}''$ Strip. The other end of this Spring Cord is passed once round the boss of the Bush Wheel 4 and is held by the set-screw.

A load sufficient to overcome the resistance of the Spring Cord must be placed on the Rod of the 1" Gear.

New Meccano Models

Screw Press—Mouse Trap—Locomotive

THE first of the three widely different models we are describing this month is a novel screw press, in which the upper die block is forced downward by a screw rotated by friction discs. This is shown in Fig. 1. It is simple, and construction should commence with the frame and the guides for the block. Two 3½" Angle Girders are bolted to further similar Angle Girders and are spaced apart at each end by 1½" Angle Girders. Two 2½" Flat Girders are attached to the structure so formed and are then bolted to 3½" channel girders, each of which consists of two 3½" Angle Girders, that form the guides. Two ½" Reversed Angle Brackets are attached to the lower ends of the channel girders.

Before the framework is completed the die block should be built up and set in position. It consists of a Channel Girder 1 bolted to 2½" Flat Girders that slide inside the guides. A Double Arm Crank is attached to a 1½" Angle Girder and a 3" Screwed Rod 2 is lock-nutted to them. The Angle Girder is then fixed to the Channel Bearing 1.

A Threaded Crank 3 is screwed on the Screwed Rod 2 and is attached to a 2½" channel girder 4 and a 2½" × 1½" Double Angle Strip. The girder 4 is connected to the side girders by 1" Corner Brackets. A 1" Pulley 5 is fitted with a 1" Motor Tyre and is mounted on the upper end of the Rod 2, where it is held firmly between two Nuts. This Pulley is rotated from either of two discs mounted on the driving shaft 6, which is 4½" long and is slideable in its bearings. This shaft carries a 2" Pulley that is driven from either a Clockwork or Electric Motor. Bearings for it are provided by the 2½" × 1½" Double Angle Strip, to which are attached two Cranks. Discs 2½" in diameter are cut from a piece of thin cardboard and glued to the faces of two Face Plates to provide friction surfaces. These Face Plates are secured on the Rod 6. They can be moved into or out of contact with the 1" Pulley 5 by means of a lever, which consists of a simple bell crank built up from a Bolt lock-nutted in one of the tapped bores of a spider from a Swivel Bearing, and engaged between two Collars on the Rod. A Swivel Bearing is attached to the spider by a ½" Bolt, which is fixed at right angles to the other Bolt. The spider is then pivoted on a ¾" Bolt held in the arms of a Cranked Bent Strip bolted to the side of the model.

A 4½" Rod is fixed in the boss of the Swivel Bearing, and at its lower end is pivotally attached to a foot pedal 7 formed from a 2" Strip lock-nutted to a ½" × ½" Angle Bracket bolted to the base. To prevent the application of too great pressure to the Pulley 5 a stop for the pedal is provided by a Flat Bracket fixed in the position shown.

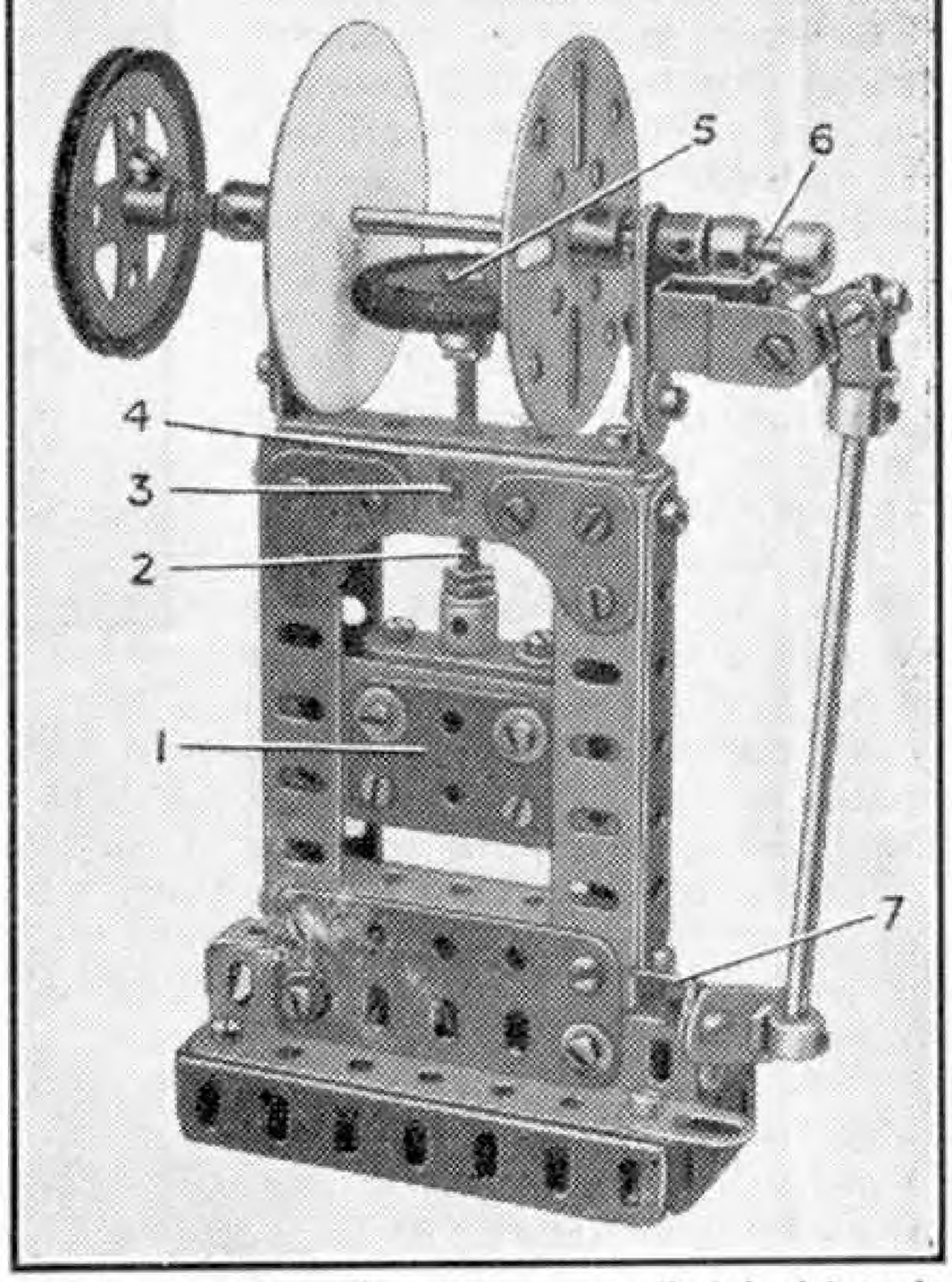


Fig. 1. An interesting screw press that is driven by friction discs.

Normally the right-hand friction disc is held in contact with the Pulley 5 by a short piece of Spring that is slightly stretched and is placed on the Rod 6 between the 2" Pulley and the nearer bearing. This disc drives the die block downward, and the latter is raised by depressing the foot pedal, which disengages the Pulley 5 from the right-hand disc and brings the left-hand disc into action.

Parts required to build model Stamping Press: 1 of No. 6; 8 of No. 9b; 3 of No. 9d; 3 of No. 9f; 1 of No. 10; 2 of No. 12; 2 of No. 15a; 1 of No. 20a; 1 of No. 22; 59 of No. 37a; 49 of No. 37b; 25 of No. 38; 1 of No. 43; 1 of No. 44; 1 of No. 47; 3 of No. 59; 2 of No. 62; 1 of No. 62a; 1 of No. 62b; 1 of No. 80c; 4 of No. 103f; 2 of No. 109; 1 of No. 111; 1 of No. 111a; 2 of No. 125; 4 of No. 133a; 1 of No. 142c; 1 of No. 160; 2 of No. 165.

The simple mouse trap illustrated in Fig. 2 may be put to practical use in catching mice. It is very easy to build, and its construction should be commenced by fixing a piece of wire to one end of a 1½" Strip 1 that is bolted at its other end to a similar Strip 2. The latter is pivoted through its centre hole on a ½" Bolt, which is passed through the arms of a Single Bent Strip bolted to a 5½" × 2½" Flanged Plate.

The lower end of the Strip 2 makes contact with a Collar fixed on the end of a 3½" Rod 3 that is free to slide in the turned-up ends of a 2½" × ½" Double Angle Strip fixed to the base. A Coupling is mounted on the other end of the Rod 3 and is fitted with a 1" Rod, which engages the centre hole of a 2½" × 1½" Double Angle Strip pivoted to the base. A Spring

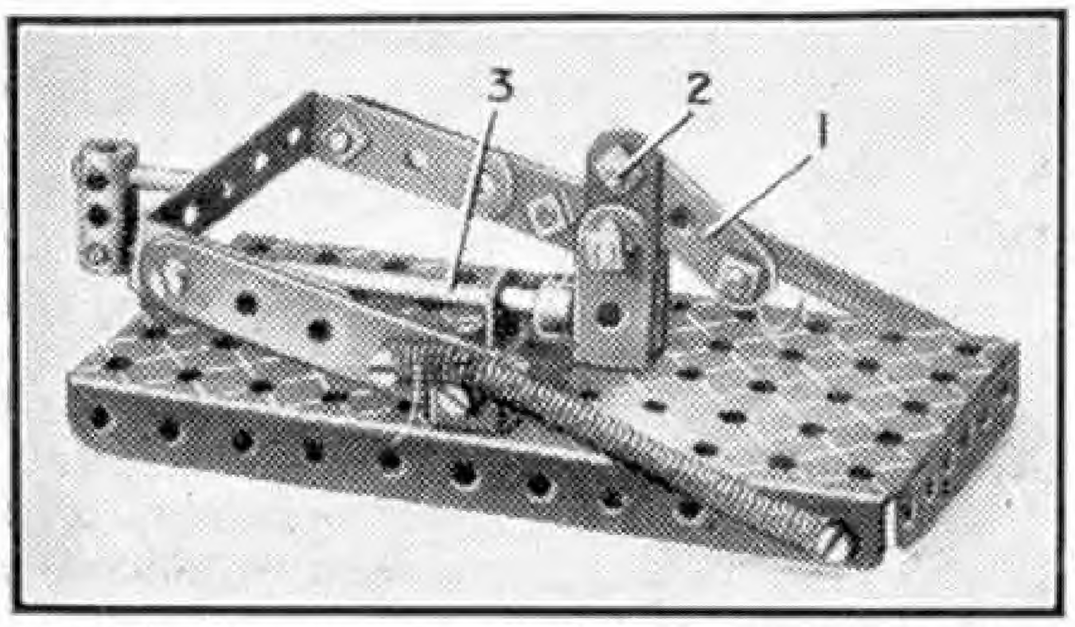


Fig. 2. A mouse trap built from Meccano parts.

is connected to each side of the base and they are attached at their other ends to the 2½" Strips.

Parts required to build model Mouse Trap: 4 of No. 5; 2 of No. 6a; 1 of No. 16; 1 of No. 18b; 19 of No. 37a; 13 of No. 37b; 4 of No. 38; 2 of No. 43; 1 of No. 47; 2 of No. 48a; 1 of No. 52; 1 of No. 59; 1 of No. 63; 1 of No. 102; 1 of No. 111a; 2 of No. 111c; 1 small piece of thin wire.

Most of us are fascinated by miniature models and obtain pleasure from examining and playing with them. We think therefore that the small locomotive shown in Fig. 3 will appeal to model-builders. This simple model requires only a few parts for its construction, and all of these will be in the possession of most Meccano enthusiasts.

The main feature of the locomotive is the boiler, which is a 2½" Cylinder. Part No. 216. A 1⅛" diam. Flanged Wheel is pushed into the front end of the Cylinder to represent the smoke-box, and the funnel, steam dome and safety valve consist respectively of a Buffer casing, a Collar and a Bolt fitted with a few turns of a Compression Spring. The Cylinder is mounted on a chassis consisting of a 3" Flat Plate 1, to the underside of which three 3½" Strips are bolted along each edge. The rear ends of these Strips overhang the Plate by one hole, and to them is bolted a 1½" Angle Girder 2. To the front ends of the Strips a 1½" Flat Girder 3 is fixed, the forward edge of this carrying a 1½" Angle Girder. Three 1½" Strips bolted to the Angle Girder form the buffer beam, the buffers themselves being represented by Bolts and Washers. A Double Bracket 6 is bolted to the buffer beam at each side of the model in the position shown, and is attached also to the underside of the chassis by means of an Angle Bracket.

On top of the 3½" Strips at each side of the chassis a 3" Angle Girder 4 is bolted, and to the rear ends of these 1½" Flat Girders are bolted to form the cab sides. The front of the cab consists of two vertical 1½" Angle Girders bolted to the sides, and the roof is formed of two 1½" Flat Girders bolted to Angle Brackets fixed to the upper ends of the 1½" Angle Girders. A third Angle Bracket 5 is bolted between the other two Angle Brackets to fill in the remaining space.

The bearings for the wheels are formed by the end holes in two 2½" Curved Strips 7 bolted to 1½" Angle Girders that are attached to the underside of the chassis.

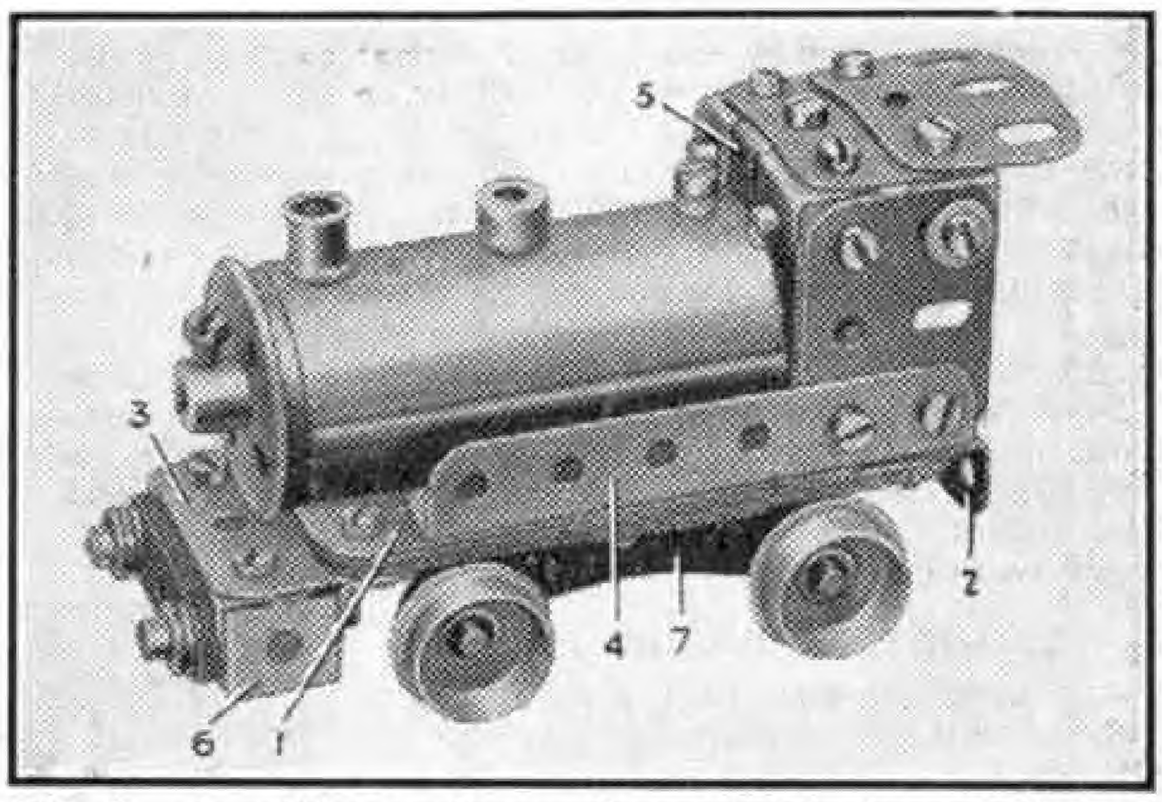


Fig. 3. A miniature locomotive suitable for running on gauge "0" rails.

Parts required to build model Miniature Locomotive: 6 of No. 3; 3 of No. 6a; 2 of No. 9c; 6 of No. 9f; 2 of No. 11; 7 of No. 12; 2 of No. 18b; 1 of No. 20; 4 of No. 20b; 45 of No. 37a; 39 of No. 37b; 12 of No. 38; 1 of No. 59; 1 of No. 73; 2 of No. 90; 5 of No. 103h; 6 of No. 111c; 1 of No. 120a; 1 of No. 120b; 1 of No. 216.

Meccano Model-Building Competition

By "Spanner"

Aircraft of various kinds are always popular subjects for Meccano models, for they include a great variety of attractive designs that can be reproduced with remarkable accuracy and realism with small Outfits as well as with large ones. This month therefore we are announcing a special competition in which prizes will be awarded for the best Meccano models of any type of aircraft. This term covers aeroplanes of all kinds, including seaplanes, flying boats, helicopters, as well as airships and gliders.

Competitors may build their models from any Meccano Outfit or number of parts, and those who possess Aeroplane Constructor Outfits may include a few of the parts from them, provided that they build the main portions of the models from ordinary Meccano parts.

Entries will be divided into two sections: A for competitors over 14 years of age, and B, for competitors under 14. The age of each competitor will be taken into consideration in assessing the merits of his work.

The following prizes will be awarded in each section: First, Cheque for £2/2/–; Second, Cheque for £1/1/–; Third, Cheque for 10/6. There will be also five prizes each consisting of a Postal Order for 5/–.

Competitors should send in either photographs or good drawings of their models, together with a brief description of any interesting feature that may be present, although the latter should be made as short as possible. The competitor's age, name and address should be written clearly on the back of each sheet of paper or photograph sent, together with the letter A or B indicating the Section in which the model is entered. Envelopes should be addressed "*Aircraft Competition, Meccano Ltd., Binns Road, Liverpool 13.*" Each Section of the competition will close on 31st May, and entries should be posted in time to reach Liverpool on or before that date.

Club and Branch News

WITH THE SECRETARY

WARTIME ACTIVITIES

Some time ago it was suggested that readers of the "*M.M.*" should write to the Editor to tell him what kind of war activity they have taken up. Many have already responded, and the record is a very fine one, including civil defence work, and the pursuit of novel and ingenious schemes for raising money for various wartime funds, or for collecting waste paper, scrap metal and the other much-needed materials. Guild and H.R.C. members also are active, and I should like Leaders and Chairmen to find what their members are doing individually, and to send on details, in addition to explaining the share that Clubs and Branches as a whole are taking in our National effort.

EXHIBITION SUGGESTIONS

I know already that Exhibitions, those valuable features of Club and Branch life, are being in part devoted to the raising of money for the "*M.M.*" Harmonica Fund and similar efforts on behalf of the men of the Forces. March is a month of Exhibitions, for it marks the close of the winter session, and I am glad to know that many of these interesting events have already been arranged for the present month. Where this has not been done, however, a special effort should be made to arrange at least an Open Night, or something similar, the proceeds of which can be devoted wholely or in part to any of the good causes I have indicated.

Elaborately organised Exhibitions are not essential, for more modest efforts are always greatly appreciated by parents and friends of members, who usually are delighted by invitations to see what their boys are doing when they meet, and ready to give support. A display of models built by members is in itself sufficient to attract attention, provided that the models are carefully constructed and are displayed neatly, so that their qualities can readily be appreciated. The award of small prizes for the best models is an incentive to good work that should not be overlooked. This gives the opportunity for more war work of real value, since the prizes may consist of War Savings Stamps, or even Certificates.

PROPOSED CLUBS

NEWCASTLE-ON-TYNE—J. Gate, 595, Welbeck Road, Walker, Newcastle-on-Tyne.

LEEK—O. C. Keeling, 5, James Street, Leek, Staffs.

PROPOSED BRANCHES

CUMBERWORTH—D. Turton, Common End, Cumberworth.

SOUTHBOROUGH—P. N. Wood and R. G. Proctor, "Woodsgate," London Road, Southborough, Kent.

BRANCHES RECENTLY INCORPORATED

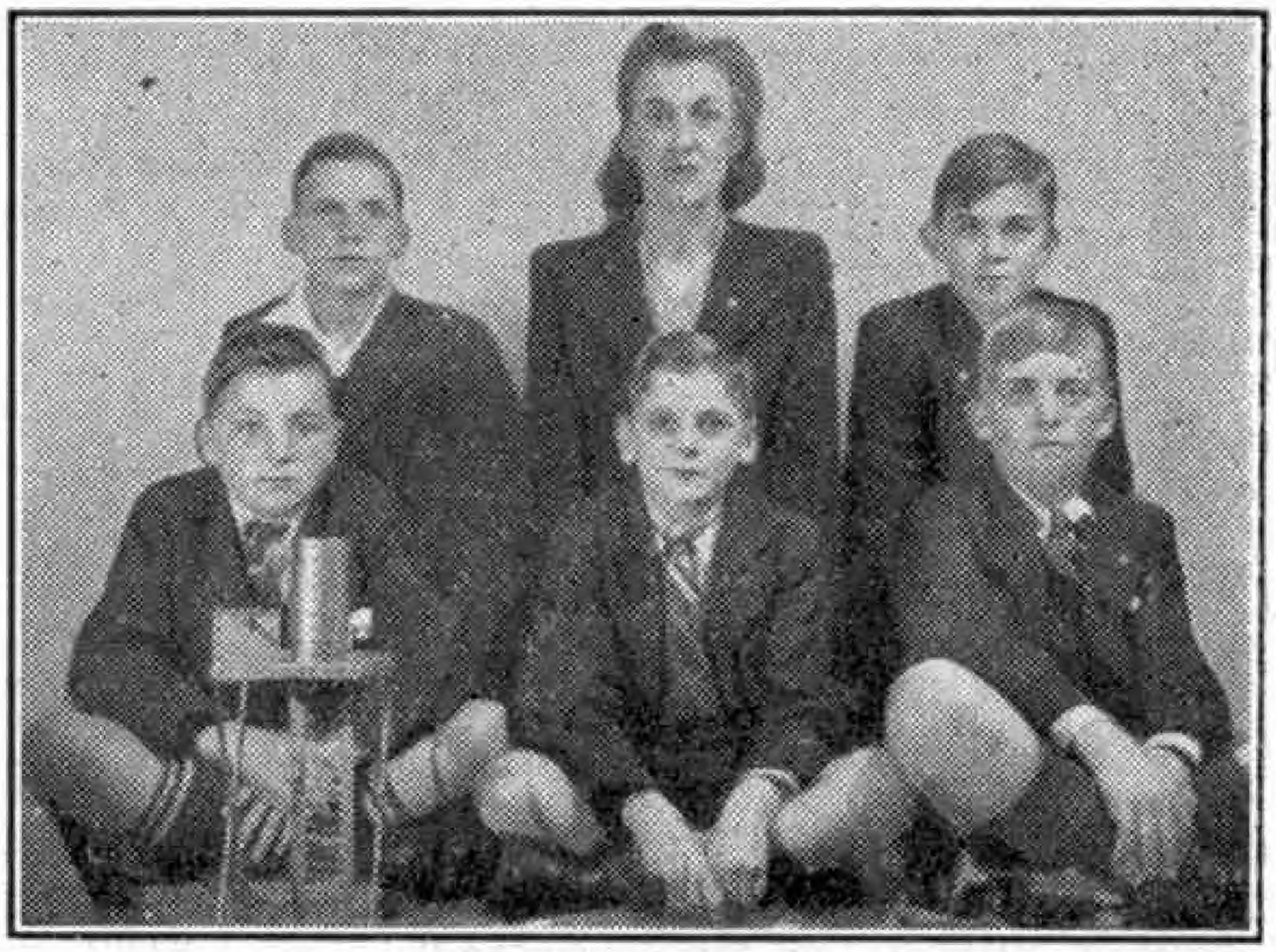
B.422—COLWYN BAY—Mr. N. R. F. Tucker, Penshurst, Lansdown Road, Colwyn Bay.

B.423—NEW MILLS—Mr. W. Taylor, 85, Spring Bank, New Mills, Stockport, Cheshire.

Club Notes

HORNSEA M.C.—Model-building has been continued on interesting lines, members working together to construct large models. Lectures also have been held, on "*The New Forest*," "*The Battle of Britain*" and other interesting topics; and the Hornby Train layout has been the scene of excellent operations. A Debate on "*Gas v. Electricity*" was conducted by the "Senior Scientists." Cinema shows and Games such as Monopoly also have been played. Club roll: 31. *Secretary:* C. Kemp, 5, Carlton Terrace, Cliff Road, Hornsea.

OAKFIELD (NEWQUAY) M.C.—There has been great activity recently. An Exhibition won great approval from parents of members who attended, and 13/6 was contributed to the R.A.F. Benevolent Fund as a result. Increasing interest is being taken in Model-building, and Dinky Toys aeroplanes are largely used, while model aeroplanes also have been built. Cycling and bus excursions are now being enjoyed. Club roll: 14. *Secretary:* C. D. Foster, Glamis Cottage, 2, Glamis Road, Newquay, Cornwall.



A group of members of the Elgin Branch, No. 414, with Mrs. M. H. Stracham, Chairman, and L. M. Hay, Secretary. This Branch was incorporated in June of last year. An excellent Hornby Train layout was quickly built up and operations are carried out at all meetings. Stamp Collecting, Meccano Model-building and other activities also have been taken up, and the Branch has an excellent Library of railway books and magazines.

Branch News

SEATON DELAVAL.—Passenger and goods train running have been enjoyed on Track Nights. Younger members practised shunting on one occasion, while the Seniors completed the resignalling of the layout. At one meeting a special layout was used in the running of long distance goods trains between a port and an aerodrome. A Lecture has been given on the "*Steam Engine*" by Mr. J. A. O'Donnell, Chairman, and on another occasion improvements in the locomotive were discussed. *Secretary:* S. O'Donnell, 104, Astley Road, Seaton Delaval, Northumberland.

Competitions! Open To All Readers

Which War Activity Would You Like Best?

Every day we read of some deed of heroism, presence of mind or quiet devotion to duty by men of our armed forces. All of these thrill our readers, but the exact impression made on them depends to some extent on their own ideas of the interest and value of the parts played by men of different services and units. We should like to know exactly which kind of outstanding deed attracts our readers most, whether they are more thrilled by reckless daring or by the thoughtful and effective use of skill and knowledge in times of danger and difficulty. With this in mind we have prepared for this month a special voting contest, which is at once easy and extremely interesting.

Below we give a list of 10 positions in our armed forces. These are widely varied and have been chosen to cover almost every kind of thrill that the war can bring. Competitors are asked to do two things—first to say which position they themselves would prefer to occupy, and then to arrange the list in the order that they think will be that indicated by the votes of all the competitors.

1. **Tank Corps Officer.**
2. **Anti-Aircraft Gunner.**
3. **Submarine Commander.**
4. **Rear Gunner.**
5. **Officer in R.A.M.C.**
6. **Radio-location Operator.**
7. **Fighter Pilot.**
8. **Commando Leader.**
9. **Destroyer Commander.**
10. **Ambulance Driver.**

Entries should be sent in on a postcard, addressed "*March War Post Contest, Meccano Magazine, Binns Road, Liverpool 13,*" and it will be sufficient to use the numbers only when making them out.

There will be two sections in this contest, for Home and Overseas readers respectively, and in each prizes of 21/–, 10/6 and 5/– will be awarded for the best entries in order of merit. There will be consolation prizes for other efforts that are deserving of recognition. Competitors should take care to write their names and addresses clearly on their entries. The closing dates are 31st March in the Home Section, and 31st July in the Overseas Section.

March Photographic Contest

In this month's photographic contest prizes are offered for the best photograph of any kind submitted. There are two conditions—1, that the photograph must have been taken by the competitor; and 2, that on the back of each print must be stated exactly what the photograph represents. A fancy title may be added if desired. We remind readers that they must not photograph any features of military importance.

Entries will be divided into two sections, A for readers aged 16 and over, and B for those under 16. They should be addressed "*March Photo Contest, Meccano Magazine, Binns Road, Liverpool 13.*" There will be separate sections for Overseas readers.

In each section prizes of 15/– and 7/6 will be awarded, together with consolation prizes for other good efforts. Closing dates: Home Section 31st March; Overseas Section, 31st July.

A "Locomotive Pie" Contest

Readers of the "*M.M.*" are keenly interested in the names and numbers of the locomotives of the four British railway companies. Practically all of them "collect" these, and study closely the lists of various classes, as we know from the many enquiries about these that reach us regularly. Here is a contest in which they can put this knowledge to good use.

Below we give a series of letters and figures, and competitors are asked to build up from these the numbers and names of as many locomotives of the British railway companies as possible. It is not necessary to use all the letters and figures in any one name and number, but each can be used as often as it appears in the list.

A A B C D E E G H I L L K N N O O P P R S S T U Y

0 0 1 1 1 2 4 5 5 6 6 7 8 8 9

An example or two will make the position clear. G.W.R. No. 4982 "*Acton Hall*" can be included in the solution, for no figure or letter in it appears more often than in the list. On the other hand the S.R. locomotive No. 858 "*Lord Duncan*" cannot be included, for the name includes two "D's," and there is only one available for use.

With these instances as guides readers should put together as many names and numbers of locomotives as they can, and should then send in their entry to "*March Locomotive Pie Contest, Meccano Magazine, Binns Road, Liverpool 13.*" There will be Home and Overseas Sections, in each of which prizes of 21/–, 10/6 and 5/– respectively, together with consolation prizes, will be awarded for the entries judged to be the best. Neatness and novelty will be taken into consideration if there is a tie for any prize. Competitors must remember to put their names and addresses on each sheet of their entries. The closing dates are as follows: Home Section. 31st March; Overseas Section, 31st July.

Our February Crossword Puzzle

We very much regret that as the result of an error in numbering, certain clues in our February Crossword Puzzle were wrongly marked, and one was omitted. We have therefore extended the period of the contest by one month, and with the following alterations competitors will be able to complete their entries from the diagram in the February issue.

Of the clues across No. 22 was omitted; this should read "Farm house and buildings." The clues across numbered 26, 28, 29, 30 and 31 should read as Nos. 27, 29, 30, 31 and 32 respectively. The clues down were correct, but the No. 11 on the diagram should be one square to the right; the word to which the clue "Disentangle" leads has seven letters.

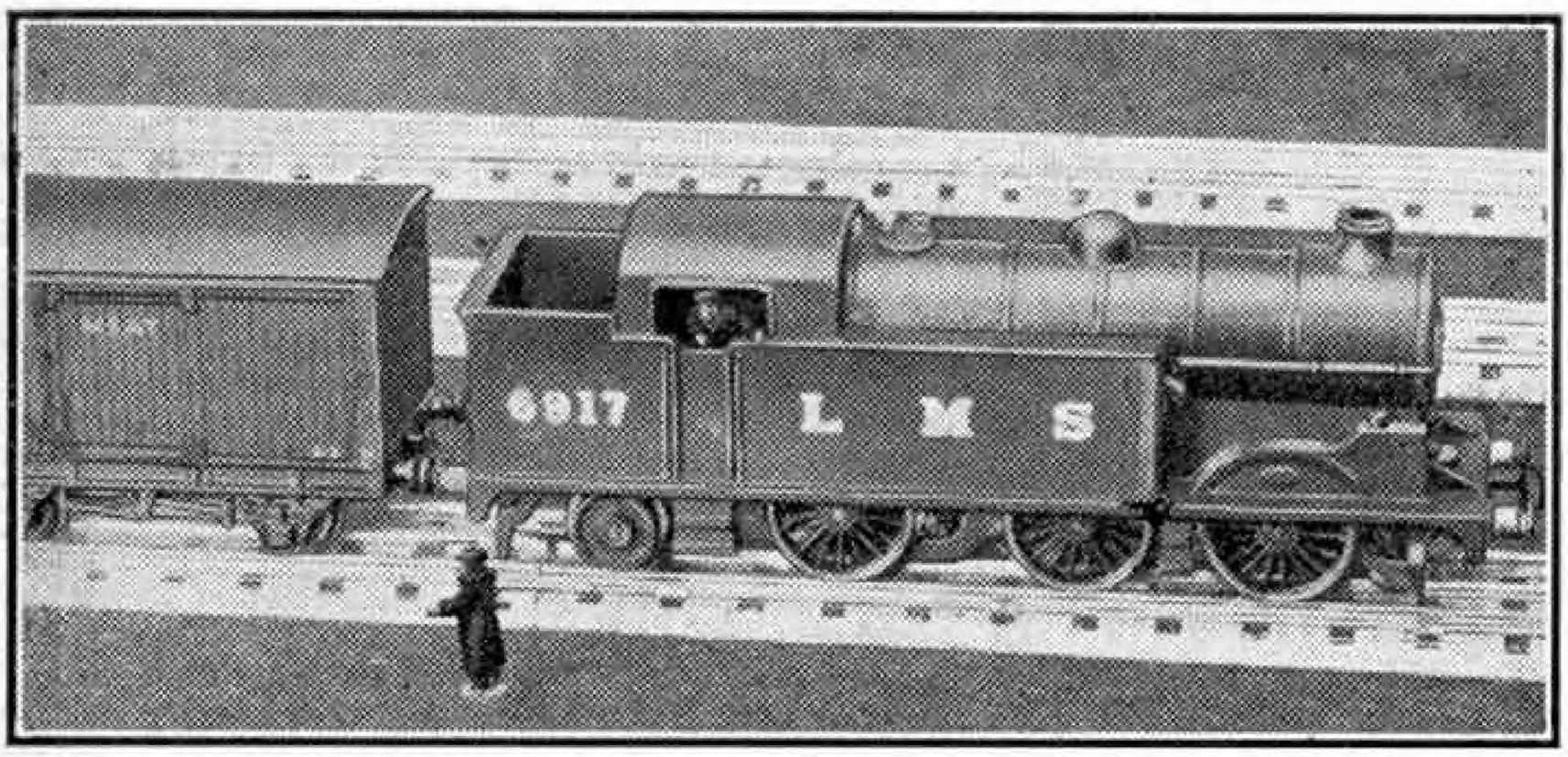
Entries in the contest should be addressed "*February Crossword Puzzle, Meccano Magazine, Binns Road, Liverpool 13.*" The prizes for the best entries are 21/–, 10/6 and 5/– and the new closing dates are 31st March and 31st July respectively in the Home and Overseas sections.

COMPETITION RESULT (Home Section)

October "Photographic" Contest.—1: Sect. A. W. Barr, Birkenhead; 1: Sect.: B, J. Alexander, Glasgow. 2: Sect. A. J. Graeme Scott, Burnley. 2: Sect. B. P. Dean, Claygate. Consolation Prizes: P. C. Ellis, Huddersfield; D. C. Finlay, Glasgow W.4; H. D. Martineau, Ingleton; D. Horder, Bristol; A. Davies, London N.6; H. Coleman, London N.22.

A Hornby-Dublo Shunting Game

MOST readers of the "*M.M.*" will, at one time or another, have watched a locomotive engaged in carrying out shunting operations. It puffs busily to and fro pulling wagons from this siding and pushing them into that until apparently the train is arranged to its liking; then as a rule it makes off down the line with the train that it has assembled from the seeming jumble of odd items of rolling stock. Actually, of course, the wagons have to be sorted out according to their destination and placed in such an order in the train that they can easily be put off at the correct point.



A Hornby-Dublo Tank Locomotive engaged in shunting operations. Note the realistic attitudes of the miniature figures.

The diagram on this page will help to show how a series of interesting shunting movements can be carried out in miniature with Hornby-Dublo equipment. The diagram represents a useful arrangement of sidings with a reception loop where trains arrive from the main line, together with a shunting spur. This spur forms an extension of the loop and permits various movements being made in the sidings without the engine having to occupy the main line.

It should be pointed out that neither the reception loop nor the shunting spur are absolutely necessary; by their inclusion, however, operations are made more railwaylike and, as we shall see, more fun is obtained. The shunting yard as a whole can be incorporated as part of a complete layout.

The rectangular shapes bearing numbers that appear in the diagram represent various wagons standing in the sidings; the numbers indicate the order in which the wagons are required to form a train when shunting operations have been completed. In following out the scheme, however, boys can alter the order and position of individual wagons to an almost unlimited extent. Splendid fun can be obtained when there are several operators each of whom tries to carry out the work in as few moves as possible. "Contests" of this kind can be enjoyed regularly at H.R.C. Branch meetings and they can form an entertaining alternative to the normal running programme.

To commence operations let us suppose that a Dublo Tank Locomotive with a Brake Van coupled to it is approaching the yard along the main line from the left-hand side of the diagram. Its business is to move the wagons about to form a complete train with the Brake Van in the rear and then work it back in the direction from which it came.

The engine and van are run into the reception loop, and stop while we consider just how to manage things so that our train is made up with the vehicles in the correct order. As the Wagon numbered 7 in the diagram is to be the last one in the train we back the engine and Brake Van into the shunting spur where the Wagon is standing. The Van is pushed up to the Wagon, their automatic couplings click smartly into engagement and we then run the engine with this little piece of train to the reception loop again. The engine, of course, is at the wrong end of the "train" so we stop on the loop, uncouple the engine from the Van and run it forward onto the main line again.

This allows the engine to "run round," for having reversed along the main line until clear of the crossover that was first used to enter the loop it can now run into the first dead-end road where Wagon 6 is waiting. Coupling up, the engine backs into the shunting spur; then pushes the Wagon forward to where the other Wagon and Brake Van are standing on the loop line and so three vehicles of our train are assembled.

Back again to the shunting spur goes the engine and then picks up both Wagons 4 and 3. Wagon 3 is pushed into the now empty dead-end road next to the loop and left there while Wagon 4 is added to Wagon 5 and the two together added to those already standing in the loop. Now we can get Wagon 2 from the top road in the diagram and add it to Wagon 3. These two are added to the growing train and our task in the yard is nearly completed. All that remains is to pick up Wagon 1 and push it into the loop, make sure our train is all in order and we are ready for despatch.

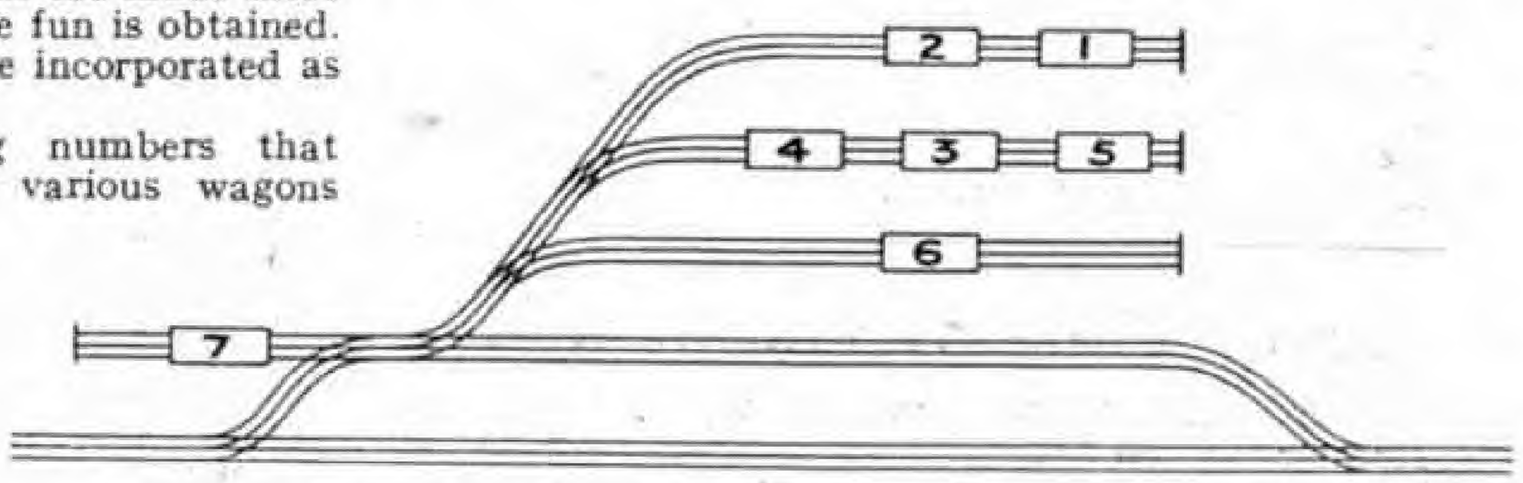


Diagram of the shunting yard layout referred to on this page.

Where shunting competitions are held between different operators the fun will become fast and furious, especially if one boy forgets to move the points and the wagons supposed to be added to the train are returned to the siding from which they have just been taken. Amusement can occur also when there are several wagons close together on the same road. An over-enthusiastic driver may then find he has pushed too hard against the first wagon and that it has coupled up automatically to the next.

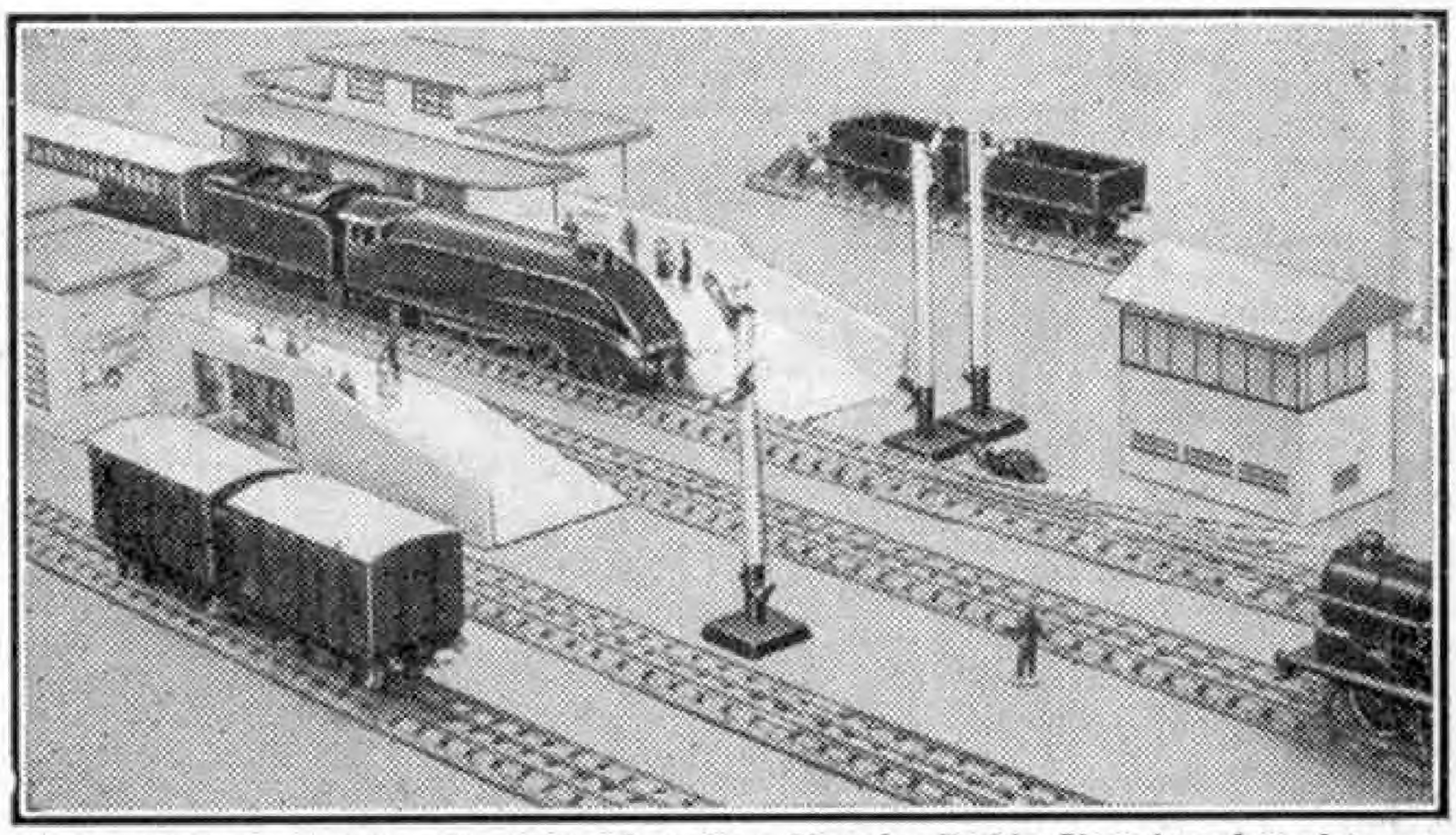
Fun with Hornby-Dublo Signals

FEW accessories add so much to the realistic effect of a miniature railway as signals correctly placed and used. Hornby-Dublo Signals are excellent reproductions of modern upper-quadrant signals. They allow of most of the signalling arrangements of real practice being reproduced, and in addition they are adaptable and can be used for different purposes according to the requirements of the moment.

In the upper illustration on this page there are two standard Hornby-Dublo Single Arm Signals of the "home" pattern standing side by side at the end of the platform of a Main Line Station. Actually these two separate signals are serving the purpose of a Junction Signal in governing the turnout just ahead of them. The left-hand signal, as viewed by the "driver" of the train approaching, controls movements branching off from the main line over the curved arm of the points; and the right-hand signal controls the road straight ahead. This explains why the semaphore of this signal is in the "off" position, meaning "line clear," as the train is an express that is passing straight along the main line. The scheme is quite effective and provides some variation from the use of the standard Junction Signal.

In a similar manner the Junction Signal, in addition to its intended normal use in controlling movements over facing points, can be used also where there are two tracks running side by side. This may be along the main line at some point, at the end of an island station platform, or at the head of a loop line just before the loop rejoins the main line by means of trailing points. Sometimes there may not be room for a separate signal for each road, but the Junction Signal can stand in between the two tracks to which it applies.

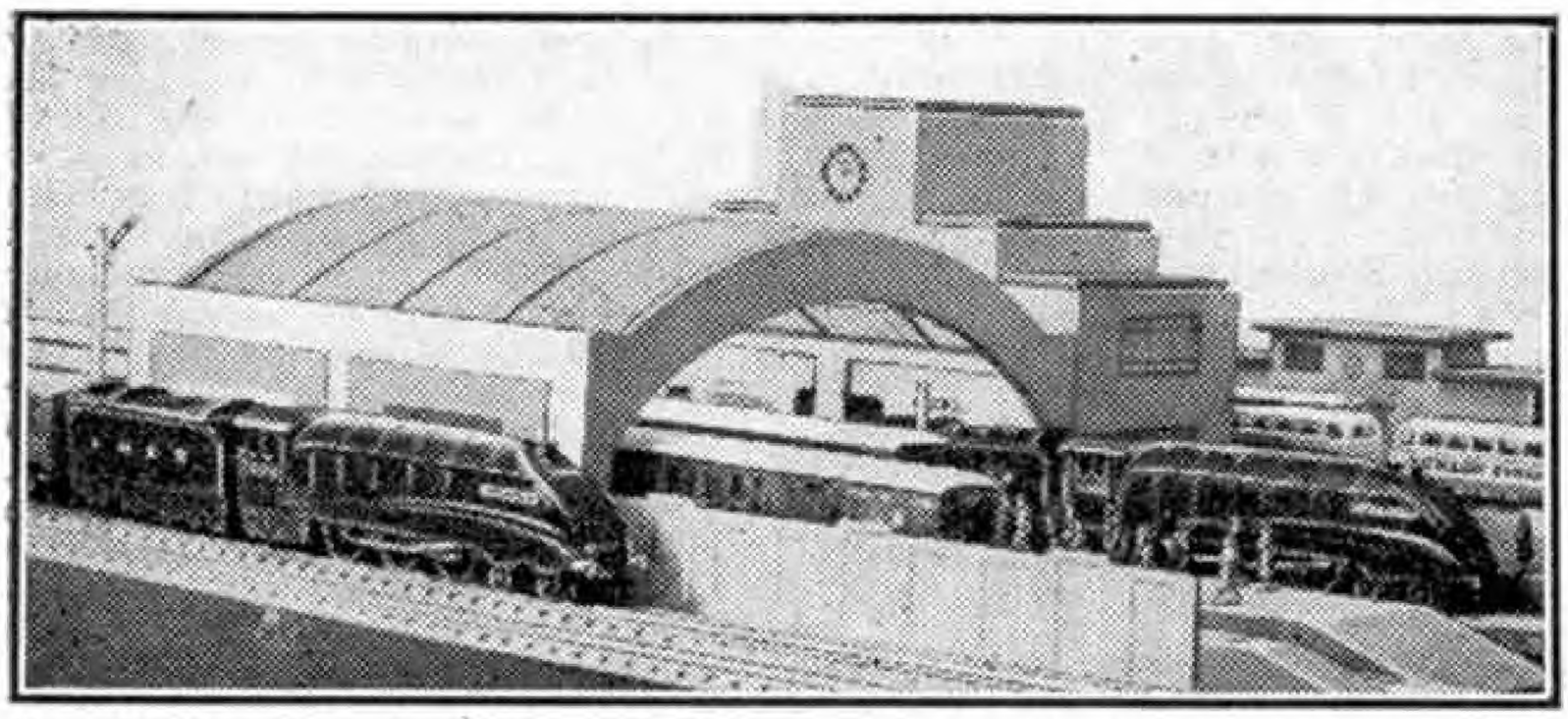
In miniature, as the distances involved are usually short, it is not always possible to place "distant" signals sufficiently far away from the corresponding "home" signals. Here the Hornby-Dublo Double-Arm Signal will be found particularly useful, for it combines a "home" semaphore and a "distant" semaphore on the same post. The "distant" arm of course applies to the next "home" signal in advance. This Double-Arm Signal can be used effectively at the approach to through stations on the main line, as it can indicate to the "driver" of a train whether a stop at the station is necessary or no . When there are several operators, and the signals are being managed independently, it will be possible for the "drivers" to control their trains exactly in accordance with the indications of the signals. This will certainly add to the fun and excitement, for the "signalmen" can operate the signals without any word to the "drivers," and the latter will have to keep a sharp lookout for signals as their trains progress.



This illustration shows the uses of various Hornby-Dublo Signals referred to on this page. Note the two separate Single-Arm Signals used to control movements over the Points.

In the upper illustration on this page a Double-Arm Signal will be noticed at the end of the platform. The "home" semaphore is showing "line clear," but the "distant" arm is at "caution"; this shows that the next "home" signal, which will be the starting signal at the opposite end of the platform, also is at "danger," and therefore the train will stop at the station. For an express train due to run through the station without stopping, the two arms would both be in the "line clear" position.

It may have been overlooked by some Hornby-Dublo railway owners that the Dinky Toys Signals can be used very well in conjunction with the standard Dublo Signals. They are slightly smaller, it is true, but this makes them very suitable for use in yards and on subsidiary lines where in real practice the posts, and often the arms themselves, are shorter than those of the main line signals. They can be used also as station signals placed on the platform, their low height being here an advantage also. As shunting signals, too, and for controlling the backing out movements of empty trains and light engines at terminal stations, they are useful. Dinky Toys Signals of course are not fitted with any mechanism for operating the semaphore arms, but these can readily be "flicked" up and down by the signalman's finger.

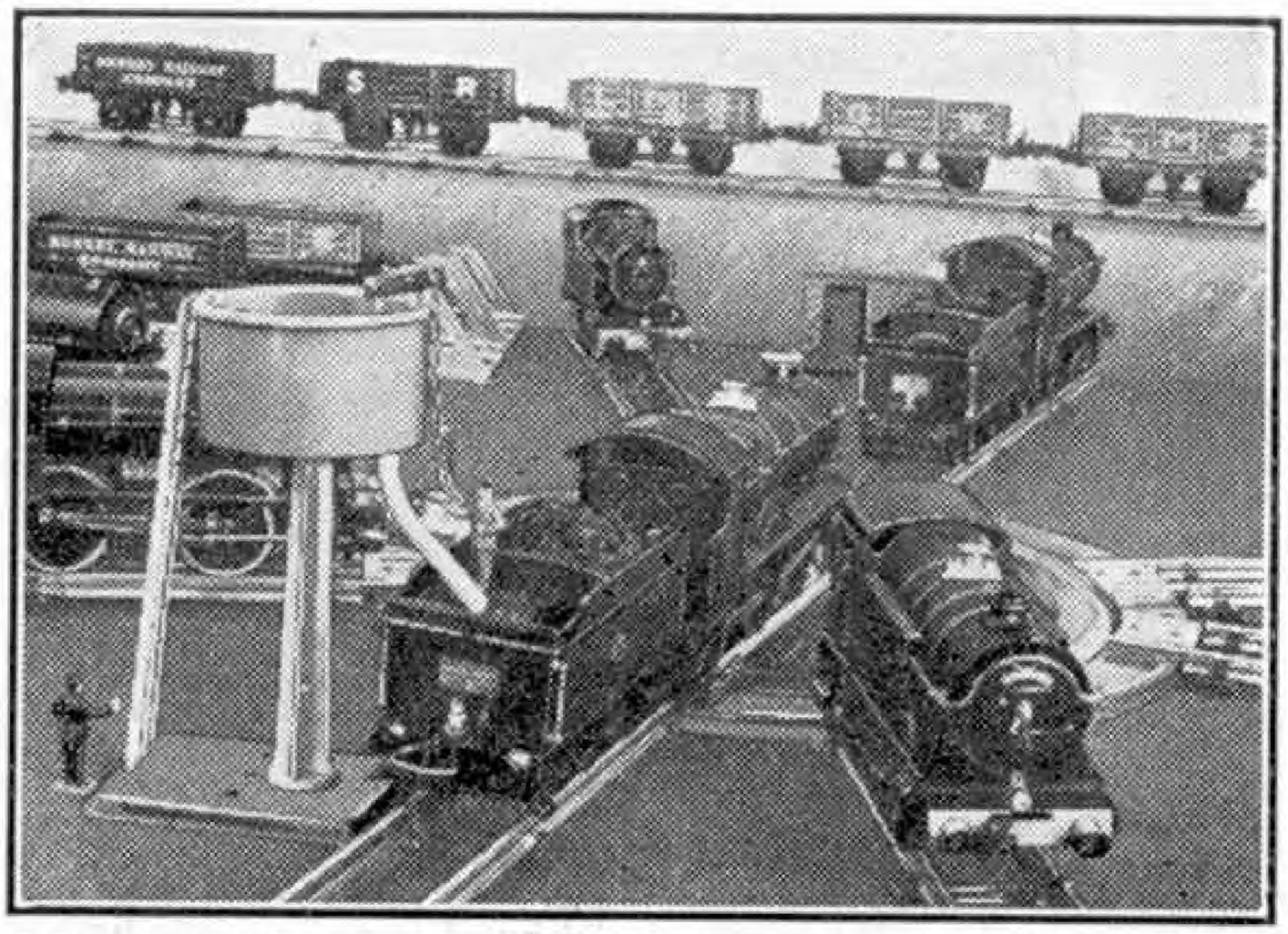


An effective view of a Dublo City Station arranged for through running. The same components can be used to make up a splendid terminus.

Hornby Turntables and their Uses

A SIGHT of which the railway enthusiast, young or old, never wearies is turning of engines on the locomotive turntable at some big station or perhaps in a yard overlooked from some vantage point. The turntable in fact is one of the most interesting appliances in use on the railway. Similarly on a Hornby railway the turntable is a fascinating accessory that adds considerably to the fun to be obtained in operations.

A point that is not always realised by Hornby Train owners is that Hornby Turntables are designed to bear a definite relation to the tinplate Rails of the Series; thus No. 1 Turntables are intended for use on layouts using 1 ft. radius curves and the No. 2 or No. 2E Turntable is intended for 2 ft. radius layouts.



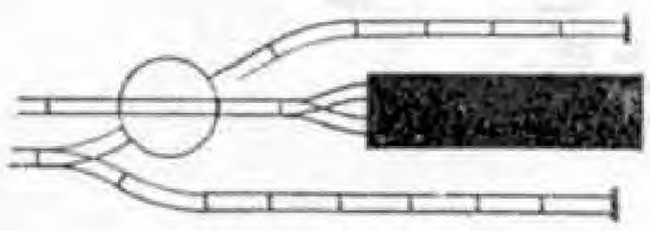
A busy scene in a locomotive yard on a Hornby railway. The No. 2 Turntable is here shown in use.

Each of the Hornby Turntables is similar in design and construction. There is a circular metal base round the raised edge of which there are placed at intervals short lengths of rail to provide the means of connecting the Turntable to the ordinary track. In the centre of the base is pivoted the moving or "table" portion of the accessory, forming in effect a line of rails on which the engine to be turned stands. The short lengths of rail referred to previously are so placed that when one end of the portion of the Turntable is brought opposite to any one of them the other end also is in alignment with a corresponding pair of rails and thus a continuous way across the Turntable is afforded. This is made clear in the accompanying illustrations.

The diagram on this page shows a characteristic use of a Turntable in the locomotive yard of a Hornby tinplate layout. The horizontal track in the centre of the diagram leads to the Turntable and straight across it to the Parallel Points that open out onto the Engine Shed roads. Two other tracks radiate from the Turntable and the upper one of these by means of a single Curved Rail is brought parallel to the Shed tracks. The lower one is formed by one of the curved arms of Double Symmetrical Points. The other arm leads to the lower siding in the diagram which is also brought parallel to the Shed line by means of another Curved Rail.

Incidentally the track running from the single or facing end of the Points can be made into a loop line connected to the centre road in the usual way by means of a set of Right-Hand Points. To do this a Straight Half Rail and a Straight Quarter Rail must be included in the centre road anywhere between these Points and the Turntable. Then the number of full length Straight Rails in the loop line will be one less than the number of similar full length Rails in the centre road. This is a useful arrangement sometimes at terminal stations. The Turntable then can not only assist in running an engine round its train for the return journey, but the engine can be turned round itself in addition. This scheme saves space at a terminal, for the track can end at the Turntable. With points, however, it is necessary to include one or two Rails beyond the Points themselves, so that engines that are to be run round on the loop line may have somewhere to stand while the switch rails are being operated.

The upper illustration shows a more extensive arrangement of tracks radiating from a No. 2 Turntable. This arrangement is sometimes found in actual practice, the shed itself being built round the turntable as it were. The shed is then termed a "roundhouse," as it is known in the United States of America where this arrangement is commonly followed. In this country a turntable used in this way is often situated under cover in the centre of the shed and the various engine roads or "stalls" radiate from it.



A useful diagram of a possible Engine Shed and Turntable layout.

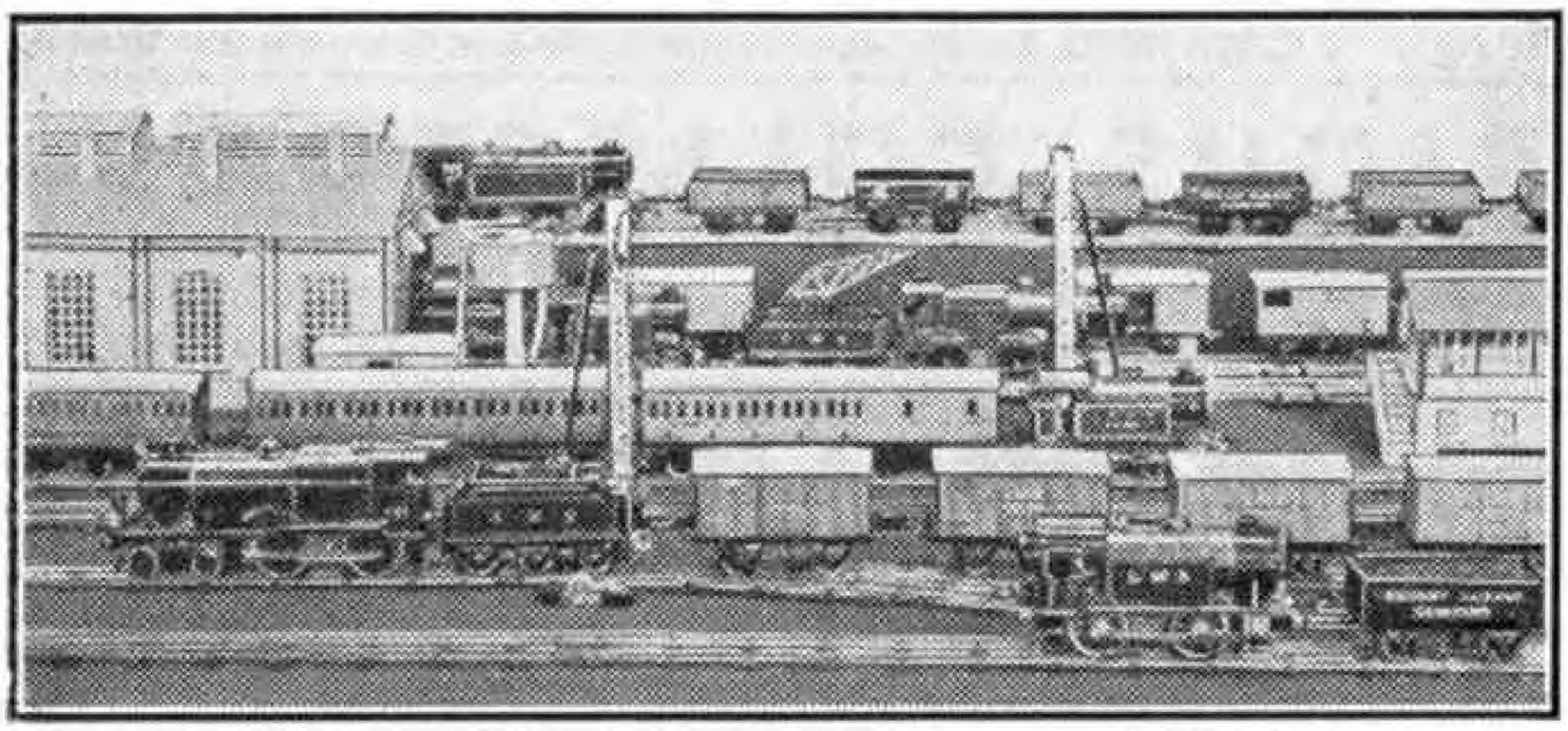
It is well to remember that the largest Hornby locomotive that can be turned on a No. 2 or 2E Turntable with its tender attached is the No. 1 Special type. The No. 2 Special Tank can be dealt with too, but unless required for a fairly fast main line run chimney first it is not usual to turn a tank engine round at the end of its journey. The bigger tender engines such as the No. 2 or E220 Special and the No. 3 type have to be separated from their tenders and each item turned on its own and then the two re-coupled. This has been necessary at times in actual practice at various places before the general installation of turntables capable of accommodating the largest engines.

An alternative, of course, is to make use of a triangular form of layout such as that mentioned in these pages last month. A triangle has the advantage that not only locomotives, but complete trains also can, if necessary, be turned round.

As far as its relation to the other track components are concerned the No. 2E Turntable of the Hornby Series is identical with the No. 2 Turntable. It is intended for electrically-operated layouts, however, and is therefore provided with a centre rail on the revolving section and on the short lengths of radiating tracks. Engines can thus be run on to the Turntable under their own power and then run off again when they have been turned round.

Minor Improvements on Hornby Layouts

THE keen model railway owner need never be at a loss for something to turn his attention to in the development and improvement of his system. On journeys by rail it becomes a habit to observe details of all kinds that can be reproduced in miniature, thus adding to the realism of the line. In this article we deal with a few ideas that are worth following up.



A realistic scene on a Hornby Layout showing sidings, main lines and an Engine Shed and yard.

Beginning with the trains themselves, most readers will be familiar with the Locomotive Headlamps that are provided with many Hornby Locomotives. The correct use of these lamps is easily learned from the H.R.C. Senior Booklet in which details of the British Standard Headlamp Code are given. It is satisfactory to know that one's trains are correctly indicated; and a great deal of fun is to be had in changing the position of the headlamps, just as real enginemen do, according to the class of work to be done.

Similarly the Tail Lamps available in the Hornby Series, for which most of the more recent types of passenger vehicles have brackets fitted, should be provided where possible in order to indicate that the train is complete. Nowadays a single tail lamp is usually considered sufficient, and there appears to be no general ruling as to which bracket at the rear should carry it.

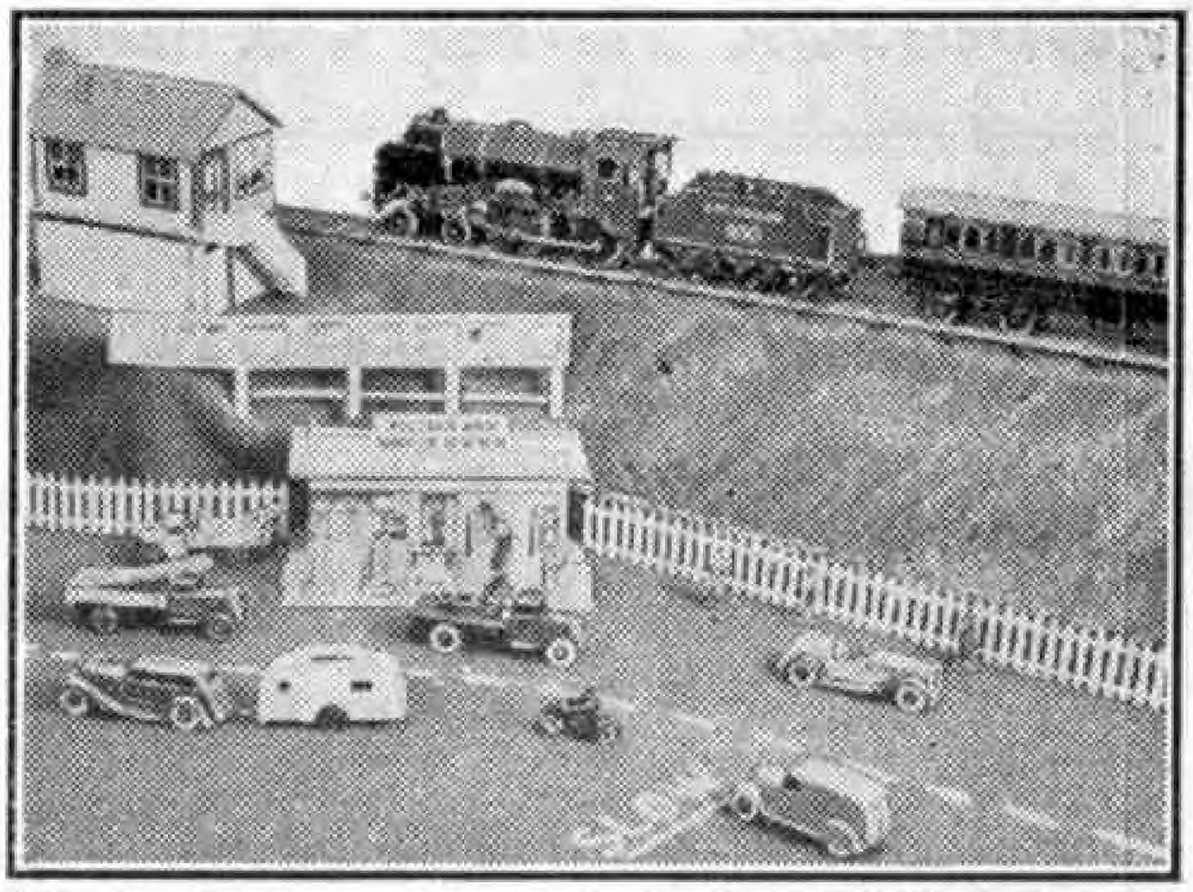
Then there are the white discs that S.R. locomotives display in the daytime instead of lamps. Miniature discs are provided with the "Eton" Hornby Locomotive, which represents the first of the well-known "Schools" class, and of course these discs can be used also on other Hornby S.R. models. They indicate the route that the train is following. The meaning of the different "engine head signals," as they are officially called, can be learned to some extent by observation, and photographs of S.R. trains afford another clue; but it is not possible for the *"M.M."* staff to supply complete lists of route indications.

To complete the list of accessories that serve to "decorate" miniature trains we may mention the Train Name Boards of the Hornby Series. No. 2 Special Pullmans and No. 2 Corridor Coaches have brackets fitted for holding the Name Boards in place. These Boards add immensely to the air of importance of a miniature express and a good selection of titles is available. Changing the Boards to suit the name or destination according to the service to be run is quite good fun and, like the positioning of lamps and so on, is one of those jobs that appeal very much to the younger members of the railway "staff."

A miniature locomotive running about with an empty tender does not look well, and no doubt most readers will have tried loading their tenders with actual coal. If this has been broken into small pieces first and then washed and dried to remove all dust it is fairly satisfactory. However, a derailment may cause it to be upset, and if the railway is laid temporarily on the table or floor there may be domestic trouble. Fortunately an excellent substitute is available in the Hornby Imitation Coal. This is not only clean and dustless, but also it is light, and if glued to a "false bottom" of cardboard made to fit inside the tender it will make no appreciable difference to the performance of even the smallest engine. Similar loads can be provided also for open wagons when a coal train is being assembled.

Another feature of most big locomotive depots in real practice is the breakdown train that is kept ready to be run off to the scene of a mishap without delay. On a Hornby Railway the normal assembly of a train of this kind can be reproduced by means of the Breakdown Van and Crane, a Flat Truck, one or two Vans, and either a goods Brake Van or passenger-type No. 1 Guard's Van.

We have often pointed out in these pages how the railway generally can be "livened up" by the presence of the various Miniature Figures representing railwaymen, passengers and so on. The Miniature Posters also can be employed very effectively to increase the realism of the miniature railway scene. They can be displayed on buildings, Paled Fencing by means of the Poster Boards, and on the splendid Station Hoarding that is made specially for them. In addition selected places on the layout can be provided with large hoardings made at home of cardboard or thin wood, on which attractive Poster displays can be arranged. An effective example of this sort of thing is seen in the lower illustration on this page. This photograph provides also some useful suggestions in the use of various accessories to add life to what otherwise might have been a dull part of the layout. A lifelike touch is given by the "signalman" at his window.



Lineside features add greatly to the effectiveness of a miniature rai.way. Note the "Signalman" at the window of the Signal Cabin.

For other Stamp Advertisements see page 120.

Stamp Collecting

Strange Stamps and How to Know Them

By T. J. Edwards

YOUNG collectors sometimes find it difficult to identify immediately the countries to which some of their stamps belong. Most albums of the fixed leaf type include illustrations, but the number of these is too small to ensure complete guidance. Experience in handling and classifying stamps with the aid of an illustrated catalogue, such as those of Gibbons and Whitfield King, provides the best way of solving the problem, but such experience is gained slowly. In this article therefore we give some quick methods of identification that the reader can easily use.

Fortunately most countries employ Roman characters, in which English is written and printed, to indicate their names on their stamps. All that the collector has to know in these cases is the form the national spelling of the name takes when it differs from that used in Britain. For example, a young collector might be forgiven for thinking that a stamp bearing the lettering "*Lietuva*" is a Latvian issue. In fact, it would be a stamp of Lithuania. Latvia, or Lettland as it is sometimes called, uses "*Latvija*," or, occasionally, "*Latwija*."

A few countries use Arabic characters, or others of a completely strange type, but add the name in Roman characters also. Egypt, Siam, modern Turkey, China and many of the Indian Native States are examples, and a further instance is given by the Ethiopian, or Abyssinian stamp reproduced on this page. A very few give no indication of their name, or only a simple symbol. Great Britain has only once given even a hint of the country of origin of its stamps; this was on the four designs of the 1929 Postal Union Congress Commemorative series, which included "*London*" in the inscriptions, since the Congress commemorated was held in that city. Only a very few stamps of the United States of America give more than the simple inscription "*U.S. Postage*," and the recent stamps of France, from about 1930, have rarely borne more than the initials "R.F.," representing "*Republique Francaise.*" These are seen on the stamp commemorating the maiden voyage of the "*Normandie*" that is reproduced on page 121. The stamp has a special interest in view of the recent serious fire in the great liner while she lay in the Hudson River, New York.

We have now classified stamp inscriptions into three main groups. These comprise stamps that bear little or no indication of the country of origin, those that use Roman characters, and those that use an alphabet not in international use. Of these the first and third groups present most difficulties. The first group is not extensive, and if catalogue illustrations and the coinage employed are studied and memorised, stamps included in it will present few difficulties. As for the third group, the gradual adoption of Roman characters for commercial purposes in most countries is steadily reducing the number of those that adhere entirely to strange symbols for their stamps. The tendency is to use the national and Roman characters side by side on their stamps.

The remaining countries, almost without exception, maintain some constant feature in their stamp designs that permits certain identification. Thus Japan invariably includes a conventional representation of its national flower, the chrysanthemum. Stamps of modern Russia can be recognised by the initials "PCCP" or "CCCP." The former were used prior to 1923, since when the latter has always been employed. Similarly Turkey uses the Star and Crescent symbols; these are not invariably employed, but we think that where these symbols are not used, the name "*Turkiye*" will be found in Roman characters. Crete and Greece use Greek characters, but can be readily distinguished from one another. The Crete stamps bear what may be freely represented by the Roman characters "KPHTH." The Greek inscription is similarly "ΕΛΛΑΞ."

In the central panel on page 121 we give a list of some of the less easily read inscriptions that readers will encounter, and in most cases brief details of the currency of the country. The names of coins often afford the key to the identity of stamps, as already suggested. Thus the appearance on a stamp of the words "*filler*" and "*pango*" is an indication that the stamp is a Hungarian one.

BINDING THE "M.M."

Binding cases for back numbers of the Magazine may be obtained from Messrs. O. H. Bateman and Co., 23, Hanover Street, Liverpool. These are supplied in two sizes (1) for six copies price 5/–, and (2) for twelve copies price 7/3, post free in each case. The binding cases are supplied in what is known as "Quarter Basil, full cloth." They are tastefully embossed in gold with the name "Meccano Magazine," and on the back is the name and volume number.

Binding 6 and 12 copies. These binding cases are supplied so that readers may have their Magazines bound locally, but where desired, the firm mentioned above will bind Meccano Magazines at a charge of 7/6 for six issues or 10/– for twelve issues, including the cost of the binding and also return carriage. The covers of the Magazines may be included or omitted as required.

These binding cases are designed for Magazines up to and including Vol. XXVI.

Stamp Gossip

and Notes on New Issues

"V" Sign on a Stamp 80 Years Ago

We wonder whether "Colonel Britton" of the B.B.C., organiser of the subterranean "V Army," knows that his famous Victory symbol had a parallel 80 years ago in a stamp that might have been designed for use in his campaign.

The capital letter V was embodied in the design for British Columbia's 3d. blue stamp of 1865. It shows up well on a dark background, and the three dots and a dash representing it in the Morse Code are to be seen in each arm of the letter. The design generally consisted of a composite of emblems of the United Kingdom, and the letter "V" was included in compliment to Queen Victoria. The design was used also in the issue of 1868-69.

The Nazis and Stamps

The Germans are finding stamps a very lucrative method of raising revenue. A recent decree, operative throughout Germany and the occupied territories, compels all stamp dealers to be licensed. Trading in stamps of enemy countries, old issues and new, is forbidden, and all stamp supplies purchased from neutral countries must be paid for twice, for the dealer must hand over to the German authorities all stamps received from abroad and buy them back again. In other words, the dealer pays 100 per cent. import tax, which of course he passes on to the collectors who ultimately buy the stamps.

One interesting feature of Germany's use of stamps to raise funds is that it is possible to buy new issues of stamps from the occupied countries, such as Denmark or Holland, more cheaply in Germany, or even Switzerland, than at post office counters in the occupied countries themselves. The explanation must be that Germany is having large quantities of these stamps printed solely to sell to collectors in Germany and elsewhere.

First Day Covers

A reader asks whether it is a practicable idea to seek to establish a chain of correspondents overseas so that he may be sure of obtaining first day covers bearing all new British Colonial stamps as issued. Other readers may have thought of the same idea, so it is probable that our answer will be of general interest.

The idea is not so good as it sounds, even for peacetime collecting, when there are few obstacles to be overcome other than that of finding correspondents. In wartime, it bristles with difficulties. Finding the correspondents in every British possession tasks the persistence of the professional who pays for the service he receives. The individual collector cannot hope to succeed in maintaining such a chain on terms that would make the scheme less costly than purchasing the covers from a dealer at home. We know several collectors who tried out the idea and abandoned it in favour of purchase from their usual dealer.

A Chinese Commemorative Series

In the face of all her difficulties, China has managed to produce a set of 10 values to commemorate the 30th anniversary of the founding of the Chinese Republic. A completely new series was out of the question, however, and resort has been had to overprinting on 10 different values of various Sun Yat Sen and Martyrs issues. Odd values are taken from different older sets to make up the series, and it seems clear that the postal authorities simply laid hands on stamps of which abundant stocks were available. In days to come, this set will be prized as an interesting example of production under wartime pressure.

* * * *

Curacao, the Dutch American colony, has come into line with its sister colonies in the East Indies by issuing a special series in aid of Prince Bernhard's Bomber Fund. Eight stamps have been issued, each bearing a premium to be devoted to the Fund. The single design adopted shows the flags of Holland and the Orange dynasty, with crossed staffs. Between them there is a lion rampant and below a scroll bearing the slogan "*Netherlands shall rise again*," as on the East Indian issues.

Belgique	**Belgium**	**100 centimes**	**1 franc**
CCCP	**Soviet Russia**	**100 kopecs**	**1 rouble**
Ceskoslovensko	**Czechoslovakia**	**100 haleru**	**1 korona**
Dansk Vestindien	**Danish West Indies**	**100 bit**	**1 franc**
Deutsches Reich	**Germany**	**100 pfennig**	**1 mark**
Eesti	**Estonia**	**100 senti**	**1 kroon**
Ethiopie	**Ethiopia, late Abyssinia**	**16 guerche**	**1 thaler**
Grand Liban	**Great Lebanon**	**100 centiemes**	**1 piastre**
Guyane Francaise	**French Guiana**	**100 centimes**	**1 franc**
Helvetia	**Switzerland**	**100 centimes**	**1 franc**
Island	**Iceland**	**100 aur**	**1 krone**
Latvija	**Latvia**	**100 santimi**	**1 lat**
Lietuva	**Lithuania**	**100 skatiku**	**1 auksinas**
		100 centu	**1 litas**
Nederland	**Holland**	**100 cents**	**1 gulden**
Norge	**Norway**	**100 ore**	**1 krona**
Osterreich	**Austria**	**100 heller**	**1 krone**
		100 groschen	**1 schilling**
Poczta Polska	**Poland**	**100 groszy**	**1 zloty**
Saargebiet	**Saar**	**100 centimes**	**1 franc**
Shqyptare	**Albania**	**100 quintar**	**1 franc**
Sverige	**Sweden**	**100 ore**	**1 krona**
Toga	**Tonga**	**12 pence**	**1 shilling**
Touva	**North Mongolia**	**100 kopecks**	**1 rouble**

This list of names and currencies of stamp issuing countries will help readers to identify strange stamps, as explained on page 119.

We thank David Field Ltd., 7, Vigo St., London W.1, for their courtesy in loaning the stamps from which the illustrations for these pages have been made.

The Navy that Flies—(*Continued from page 92*)

this war began. We have heard a lot about the Naval torpedo machines dashing into Taranto Harbour and torpedoing Italian ships there. We have heard of torpedo machines catching Italian ships in the Battle of Cape Matapan and delaying them so that our big ships were able to come up with them. We know that the torpedo-droppers from aircraft-carriers hit the German raider "*Bismarck*" and slowed her down so that our big ships were able to catch her and sink her.

Yet somehow our Naval pilots have never had the full credit for their astounding bravery. We hear all about the R.A.F. pilots diving into masses of anti-aircraft fire over German cities and of their gallant sweeps over the coasts of the Continent, and we heard all about their fights against terrific odds in the Battle of Britain.

Nothing could be finer than the work the R.A.F. have done, but few people realise that the work of the Fleet Air Arm has been every bit as fine. At the time of the invasion of Norway by the Germans I was staying with a friend who commanded one of our coastal aerodromes. There he had one squadron of the Fleet Air Arm mounted in those slow old Fairey "Swordfish." These fellows were taking great big cylindrical parachute mines out every night and dropping them in the Skagerrak and the Kattegat and right out across the coasts of the Baltic. The observer's seat had been taken out and replaced by a huge cylindrical petrol tank which practically sat on the knees of the navigator-gunner in the back seat and separated him from the pilot in front. Those chaps used to go out on flights of eight or nine hours, crawling along at not more than 90 miles per hour with that terrific load, easy meat for any fighter which did happen to catch them. And yet practically all of them used to come home every morning, and be ready to go out again at night. I have never seen such an exhibition of what Napoleon Bonaparte called "three o'clock in the morning courage."

Also we have heard a lot about the "samurai" spirit of the Japanese pilots who hurled their torpedo-machines straight at the "*Prince of Wales*" and the "*Repulse*" off the coast of Malaya. But we have never been told how many of our old "Swordfish" were blown to pieces in the air, torpedoes and all, by direct hits from the guns of the "*Bismarck*" before a few of them got their torpedoes into her. All we know is that every now and then we see in the death column of one of our bigger and better papers that some mere lad, a Sub-Lieutenant R.N. (A) or R.N.V.R. (A) has been killed on active service or lost at sea.

And we hear nothing of the Fleet Air Arm pilots and observers who have flown off the carriers or who have been catapulted off cruisers or battleships to go scouting over the great oceans looking for enemy raiders and submarines, and have never come back.

Three lads in one of these reconnaissance machines ran out of petrol in the North Atlantic and had the luck to come down alongside a boat which had evidently been launched from a torpedoed steamer of good class. The crew must have been picked up very shortly afterwards for nothing in the boat had been disturbed; all the provisions were there and everything. So these lads started to sail for Greenland. After a day or two they met a boat full of Danes headed for Iceland. They argued quite a lot about whether they should all go to Iceland or to Greenland, and eventually decided each to go their own way. The Fleet Air Arm lads were picked up soon afterwards by a warship. But they were the lucky ones. How many have disappeared we do not know.

But in everything they have done the new Naval Air Service is worthy of the highest traditions of the British Navy and of the old Royal Naval Air Service of the last war.

Copper—The Story of the Red Metal—

(*Continued from page 100*)

high thermal conductivity, which is greater than that of any metal except silver, makes it an ideal material, therefore, for use for all purposes where heat has to be transferred, as in the case of heating or cooling apparatus, cooking vessels, water heaters, radiators, milk coolers, refrigerators and similar devices.

Unlike many other metals, copper is not only easy to fabricate, but it can be jointed without any difficulty by soldering, brazing or welding. This feature is of the greatest importance, not only in the jointing of electrical conductors, but also in the joining of copper water pipes and similar operations, as well as in the manufacture of the multitude of articles now made from copper.

The freedom from deterioration and the extraordinary lasting qualities of copper cannot be demonstrated better than by the fact that copper objects thousands of years old are in existence to-day. These objects have withstood the severe combined effects of both atmospheric and subterranean conditions since the dawn of civilisation, and of all man-made things can most truly be said to have withstood the test of time.

We wish to acknowledge the courteous assistance of the Copper Development Association in the preparation of these articles, and in particular for permission to make free use of the publications of the Association.

Testing a Worm Reducer Unit—

(*Continued from page 93*)

From the input and brake horsepower values the efficiency of the "*Radicon*" gear unit can be calculated.

Two thermometers are shown inserted into the gear case. The bottom one passes through the drain hole into the oil sump and measures the temperature of the main body of the oil. The top one is carried in a cork in the breather hole, and the bulb is placed in the stream of hot oil thrown off the worm wheel. Usually a load test is continued until the thermometer readings become steady. When that condition is reached the losses in the gear unit due to tooth friction, oil churning and bearing losses, converted into heat, are just balanced by the amount of heat which the outside area of the case will dissipate at the steady temperature.

A load test such as the one illustrated will check therefore the horsepower that can be transmitted for a given rise in temperature—usually, 100 deg. F. above that of the surrounding air—and the efficiency of the gear unit.

COMPETITION RESULTS

HOME SECTIONS

October "Advertising Slogans" Contest.—1. F. Mills (Kearsley); 2. W. Short (Kendal); 3. J. Brown (Harrow Weald). Consolation Prizes: D. Boulton (Chesham); N. Ashurst (Warrington); B. Figgins (London N.19).

October "Choose Your Routes" Contest.—1. G. Balfour (Upminster); 2. M. J. Bach (Torquay); 3. J. Mallin (Radcliffe). Consolation Prizes: J. Guthrie (Meigle); H. Clarke (North Watford).

November "Book Titles" Contest.—1. H. Collings (Blackburn); 2. L. Hunter (Sheffield); 3. A. Fraser (Palmont). Consolation Prizes: L. Denne (Morden); A. E. Honey (Belper).

November "Photographic" Contest.—1: Sct. A, J. Mitchell (Bradford); 2: Sect. A, S. S. Pethybridge (Newton Abbot). 1: Sect. B, M. W. Taylor (Southall). 2: Sect. B, A. Rose (Ulverston). Consolation Prizes: A. Battrick (York); J. Graeme Scott (Burnley); B. Chulindra (Rock); D. R. MacFarlane (Bristol); R. J. Taylor (Bradford).

November "Voting" Contest.—1. K. Raynor (Ilkley); 2. P. Royle (Stockport); 3. R. Stevenson (Maidstone). Consolation Prizes: R. Simpson (Oxford); D. Mitchell (Ilford).

December "Price Codes" Contest.—1. D. T. Marsh (Birmingham); 2. T. D. Tasker (Barnsley); 3. E. C. Oliver (Yeovil). Consolation Prizes: F. Paris (Hailsham); R. A. Wood (Middlesbrough)

Fireside Fun

"I understand you have been having your family tree looked up," said Jones.

"Yes," replied Brown, "and it cost me £500."

"Quite expensive, wasn't it?"

"Yes. It cost £200 to have it looked up; the other £300 was what I paid to have it hushed up."

* * * *

"What's your name?" the grocery store manager asked the young applicant for a job.

"Scott," replied the lad.

"And your first name?"

"Walter."

"That's a pretty well-known name," remarked the manager, with a smile.

The boy looked pleased.

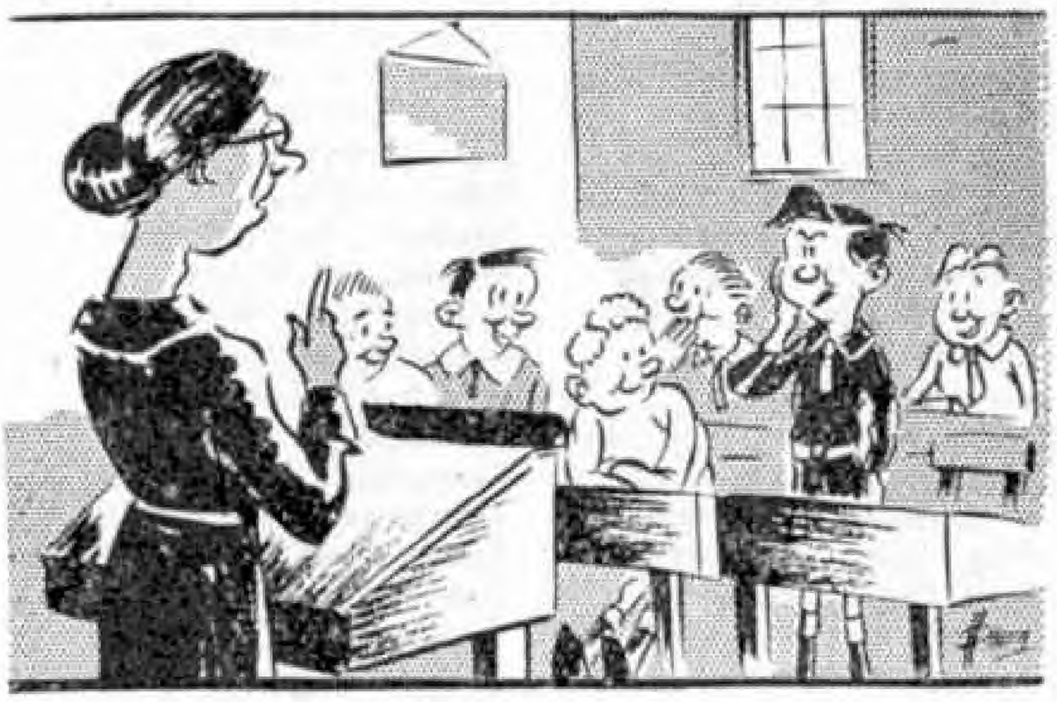
"It ought to be," he replied. "I've been delivering groceries around here for two years."

* * * *

THE DEBTOR HAD BEBTOR!

A shopkeeper, writing a debtor,
Remarked in the course of his lebtor
That he chose to suppose
A man knows what he ose,
And the sooner he pays it the bebtor.

* * * *



"Tommy, come here and give me what you have in your mouth!"

"I'd like to, Teacher. It's toothache!"

* * * *

"My friends," said the preacher, "you will remember that I promised to speak to you to-night on 'The World's Greatest Liars,' and that I asked you to prepare your minds by reading the seventeenth chapter of St. Mark. Kindly raise your hands if you have done so."

Every hand went up.

"Thank you," the preacher continued. "As there are only sixteen chapters in St. Mark, my subject will not be entirely unappropriate."

* * * *

Asked to paraphrase the sentence: "He had a decided Literary bent," a scholar gave this version—

"He was very round-shouldered through excessive writing."

* * * *

Lawyer (to coloured prisoner): "Well, Rastus, so you want me to defend you? Have you any money?"

Rastus: "No, suh, I hain't got no money but I got a 1922 model Fo'd cah."

Lawyer: "Well, you can raise some money on that. Now let's see—just what do they accuse you of stealing?"

Rastus: "A 1922 Fo'd cah."

* * * *

THIS MONTH'S HOWLER

The pineapple is the fruit of the pine tree.

"They do say ye be able t'tell moy character boy moy 'and."

"Yes, and for a start, you're from the country."

"By gum! It be wunnerful!"

* * * *

Boss (to Pat): "So, you want to leave the works. Are your wages insufficient?"

Pat: "Shure'n'taint that, sur, but I'm afraid I'm doin' a horse out of a job."

* * *

GOODBYE FOREVER

This report was found by a doctor in India who had left a native assistant in charge of a serious case:

"11.00 a.m.—Patient in low degree."

"11.30 a.m.—Patient in the sink."

"12 noon—Patient on the flit."

"12.06 p.m.—Patient flut."

* * * *

Old Lady (meeting a one-legged tramp on the street): "Poor man, you have lost a leg, haven't you?"

Tramp (looking down): "Well, I'll be dashed if I haven't!"

SOUVENIR COLLECTOR

Gent.: "I was frightfully embarrassed when dropped my fork at the banquet."

Lady: "Why, everybody drops a fork now and then."

Gent.: "Yes, but everybody doesn't drop one out of his coat sleeve."

* * * *

A little girl went into a chemist for some pills.

"Anti-bilious?" said the chemist.

"No, mummy is," replied the little girl.

* * * *

They were writing letters. Hubby suddenly looked up worried.

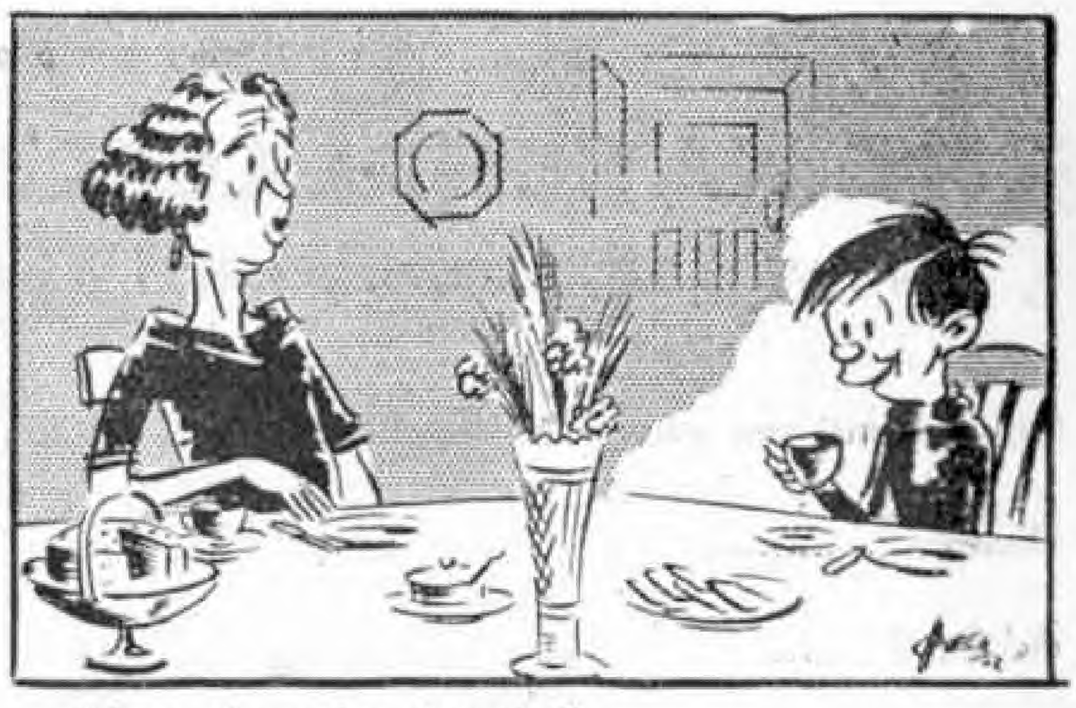
"What's the matter," asked his wife.

"Why-er-I had it on the tip of my tongue and now its gone."

"Never mind," she said soothingly. "Just think hard for a moment. It's sure to come back."

"Thinking hard won't help it this time—it was a 2½d. stamp."

* * * *



"Pass the cake, Auntie!"

"If what, Tommy?"

"If you can reach it!"

A WONDERFUL BARGAIN BOOK OFFER TO MECCANO MAG. READERS

Hours of Enthralling Entertainment

The HANDYMAN AND HOME MECHANIC

LOOK

Below are just a few of the thousands of things you can make and do with the aid of this book:

Repairs in the Home—How to Correct Wireless Faults—How to Charge an Accumulator—How to Mend a Bicycle, Car or Motor Cycle—Developing and Printing Your Own Films—How to Do Carpentering—Care of Tools—Mending Furniture—Painting — Distempering — Paper-Hanging—Laying Lino—Staining—Burning-off Paint—Metalwork—Curing Smoky Chimneys — Mending Burst Pipes—Testing and Clearing Drains — Repairing Kitchen Utensils—Electrical Repairs of all Kinds — Remedying Damp Walls—etc., etc.

A wonderful book that tells and shows you Thousands of Things-to-Make-and-Do

Readers! Here is something really DIFFERENT!—something after your own heart!—a sensational Wartime Book Opportunity, THE HANDYMAN AND HOME MECHANIC!—the most practical how-to-do-it book ever published for everyone who is "useful with his hands"! This gigantic book, containing 512 pages, 230,000 words and 600 step-by-step drawings, diagrams and photographs, which shows how to make and do thousands of useful and instructional jobs in your home and garden, is made available to every Meccano Magazine reader at a low Privilege Price.

Supplies limited, applications in rotation. You must post the Order-Labels below, with your Remittance, AT ONCE!

Look on the left at just a few of the subjects this book deals with! It will make you a *real* handyman—able to tackle any repairs, decorating, fitting, or construction from mending a faulty tap washer to making a professional-looking cabinet! You can never tell when it might rest on *you* to save the situation if an emergency repair job has to be done in the home. Everything is so simply and clearly explained that you *can't* go wrong!

For the Standard Edition bound in Maroon Bookcloth, embossed in Gold, send only 4/9. For the De Luxe Edition, bound in Scarlet Leather-cloth, embossed in real 22-Carat Gold, send only 5/9. Prices include carriage, packing, insurance, etc.

DO THIS NOW

Fill in Order-Labels below. Indicate Edition required and tip down 1d. stamp to space provided for your Special Privilege Printed Matter in connection with our next big Book Opportunity, and post together with a P.O. for correct amount according to Edition required to:

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"Handyman and Home Mechanic"
Book Dept., X.M.M.D.
Kings Langley, Herts.

Make P.O. payable to Odhams Press Ltd., and cross /& Co/.

CUT HERE—WRITE IN BLOCK LETTERS BELOW

NAME.....

FULL POSTAL ADDRESS.....

.....

.....

Offer applies only in Gt. Britain, N. Ireland and Eire. (X.M.M.D. March 1942)

YOU MUST TIP DOWN A PENNY STAMP CAREFULLY TO THE TOP RIGHT CORNER

STANDARD EDITION (4/9) / DE LUXE EDITION (5/9) } **STRIKE OUT EDITION NOT REQUIRED**

H

BOOKS WITH CARE **CARRIAGE PAID HOME**

NAME.....

ADDRESS.....

TOWN.....

COUNTY.....

If undelivered, return to Odhams Press Ltd., Kings Langley, Herts.

READERS' SALES AND WANTS

SALES

Sale. Clean Cigarette Cards. Seven nearly complete sets. Offers—Philip Rose, 455, Burnley Road, Colne, Lancs.

Meccano cost 40/- accept 25/-; Model "A" Simplex Typewriter 7/6, or exchange for Hornby 20v. Gauge "O" L.N.E.R.—Graves, 12, Pinewood Close, Shirley, Surrey.

Sale. Over £30 Hornby-Dublo Electric Railway either complete or in four separate sets. Write—Fairhurst, 91, Rochdale Road, Middleton, Lancs.

Sale. £12 Meccano, Cabinet, Electric Motor, Transformer, Car; Aeroplane Outfits £6; also Construment "100"; "Plus," Cinematograph Outfits, £2.—Hay, 357B, Hagley Rd., Birmingham.

Sale. 14 "Magnets" and 70 "Hotspurs," 11/- or nearest offer—Barr, 78, Kings Acre Rd., Glasgow S.4.

For Sale. Meccano and Erector parts; 2 dozen (straight) Bing Clockwork rails, gauge "OO", 4d. each; acute Angle crossing 2/-; 2,000 Cigarette cards, large and small. Want Hornby rolling stock and Toy moulds.—Usher, 27, Mossgiel Crescent, Dundee.

Sale. Cigarette Cards complete sets or spares (very numerous) all brands and sizes. Excellent condition. "M.M." for January, March and April 1940. Enquiries and offers invited—Aynsley, 3, Branksome Road, Bristol 6.

Sale. Gauge "O" Electric Tank Loco. (non-reversing) coach, 10 wagons, track, station, accessories, cost £8, sell £5 10s. or exchange for Gauge "OO" complete set. Stamp for particulars.—Provan, 2, Bentfield Ave., Ayr, Scotland.

Sale. Red/Green and Blue/Gold Meccano; stamp for list. Wanted. No. 2 Special Passenger Clockwork S.R., exclude rails, willing to give £2 or exchange and £1 cash.—Green, 11, Water Lane, Angmering, Sussex.

Sale. "Meccano Magazines" 1940-1941, Mechanised Units, Aeroplanes, Books, Card Games and good Stamp Album. All in good condition.—Burley, Cranmore House, Shirley, Birmingham.

Sale. Cigarette Cards; Packets of Stamps; Books. Stamped envelope for lists.—Pitman, "The Moorings", Sand Bay, Kewstoke, Weston-Super-Mare.

Sale. Bibliography of British Ornithology, complete to 1918; also quantity of Gauge "O" Trains and accessories. Large selection of Books. For particulars—Melville, Kingswear Lodge, Kingswear S. Devon.

For Sale. Complete Hornby set with 2 Engines in good condition, will take £5. Apply—Taber, 31, The Avenue, Witham, Essex.

Complete volume of "I Was There" War Books (51) 1914-18 (unbound). Cost value 39/-, Price £1; also "Flight" Oct. 24, 1940-May 8, 1941 (29). Cost value 25/-, Price 10/-. Two volumes of "Chums" 1938 and 1939, both in perfect condition. Price 15/- Postage paid.—191 Baker Street, Enfield, Middx.

Sale. Large quantity of Meccano, including two Electric and one Clockwork Motor, complete with Transformer and Meccano Roller Race. To-day's price about £25; accept £12.—D. Rich, 36, Shrewsbury Drive, Upton, Wirral.

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Display. Quotations for space bookings, and latest net sale figures, will be sent on request.

READERS' SALES AND WANTS

(Continued from page vii)

WANTS

"Trix" Southern Motor Coach or Metropolitan Locomotive; good condition.—Pettitt, 16, Hillside Road, Northwood, Middlesex.

Twin Trix; wanted to purchase parts, particularly Rails and Remote Points; list and prices to—McCullagh, Riverside House, Newry, Co. Down.

Out of print selections of the Scientific Book Club.—White, 79, West Bromwich Road, Walsall, Staffs.

Wanted—Bassett-Lowke "Mogul" Steam Engine. Particulars—Hollingsworth, 214, Skipton Road, Keighley.

Wanted for Cash. Gauge 0 3 ft. radius track.—B. Jarvis, Hillside, Cowley Lane, Chapeltown, Sheffield.

Wanted. "M.M." for Jan. and Feb. 1941, in good condition.—A. J. Hawking 1, Locarno Villas, Forge Lane, East Farleigh, nr. Maidstone, Kent.

Wanted. Sets of Chess (wood) second-hand.—Green, Ranworth, Dormans Rd., E. Grinstead.

Wanted. Collections of Stamps; send stamps and price required to—W. M. Jenkins, 28, Reginald Road, Scunthorpe, Lincs.

Wanted. Large Red and Green Meccano in good condition.—Ford, 140, Bath St., Rugby, Warwickshire.

Wanted. "M.M.'s" for all 1925, all 1931, in good condition. Also 12 of Meccano part No. 7, 4 of 167b.—Cooke, 19d, Turres Road, Cheadle Hulme, Cheshire.

Wanted. "Meccano Magazines," January to April 1941 inclusive. In good condition with covers. Pay 6d. each. Also "Magic" and/or No. 1 Motor.—Turner, Thatched Cottage, Upleadon, Newent.

Wanted. Meccano Magazines, January-February, 1941. Pay 1/– each.—Colegrave, Fermoy Cottage, Harston, Cambridge.

Wanted. No. 1 Tank Loco. or M3 Tank Loco.—Burn, 26, Holly Ave., New Haw, Surrey.

Wanted. Meccano Magazines for 1935 and 1936 complete.—Kelleway, Pound Cottage, Bromham, Chippenham.

Wanted. Trix railway layout. Will pay £4-£6. State particulars.—Philpot, Mount Radford School, Exeter.

Wanted. Numbers of magazine "British Birds."—Melville, Kingswear Lodge, Kingswear, S. Devon.

"Magnets," "Gems," "School Boys' Own Library," "Boys' Friend Library."—191, Baker Street, Enfield, Middx.

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